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Part I (Prompt Reports)

NO. 515 JULY 1987

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JUNE 1987
MAY 1987

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NATIONAL GEOPHYSICAL DATA CENTER
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NUMBER 515

(Issued in Two Parts)

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INTERNATIONAL URSIGRAM AND WORLD DAYS SERVICE

Summary of the Geoalert Messages **JUNE 1987**

Julian Day	Date of Issue	Date of Observation	Wolf No.	10-cm Solar Flux	A-index	Location °Lat °Long	Flares Total	M	X	Date of Forecast	Location °Lat °Long	Region Forecast[1]	Geoalerts
152	01	31	012	075	013	N22 W44	0	0	0	01	N22 W44	Q	Solquiet, Magquiet.
153	02	01	014	076	008	N22 W59	0	0	0	02	N22 W59	Q	Solquiet, Magquiet.
154	03	02	011	076	010	N22 W69	0	0	0	03	N22 W69	Q	Solquiet, Magquiet.
155	04	03	000	074	004	Spotnil				04	Spotnil		Solquiet, Magquiet.
156	05	04	000	075	007	Spotnil				05	Spotnil		Solquiet, Magquiet.
157	06	05	000	074	005	Spotnil				06	Spotnil		Solquiet, Magquiet.
158	07	06	000	074	020	Spotnil				07	Spotnil		Solquiet, Magquiet.
159	08	07	000	074	011	Spotnil				08	Spotnil		Solquiet, Magquiet.
160	09	08	000	075	005	Spotnil				09	Spotnil		Solquiet, Magquiet.
161	10	09	000	075	005	Spotnil				10	Spotnil		Solquiet, Magquiet.
162	11	10	000	076	005	Spotnil				11	Spotnil		Solquiet, Magquiet.
163	12	11	012	078	012	S11 W06	0	0	0	12	S11 W06	Q	Solquiet, Magquiet.
164	13	12	035	080	012	S11 W20	0	0	0	13	S11 W20	Q	Solquiet, Magquiet.
						S19 W38	0	0	0		S19 W38	Q	
						N27 E73	0	0	0		N27 E73	Q	
165	14	13	023	080	010	S19 W50	0	0	0	14	S19 W50	Q	Solquiet, Magquiet.
						N28 E58	0	0	0		N28 E58	Q	
166	15	14	011	078	007	N28 E46	1	0	0	15	N28 E46	Q	Solquiet, Magquiet.
167	16	15	011	078	002	N27 E34	0	0	0	16	N27 E34	Q	Solquiet, Magquiet.
168	17	16	000	079	006	Spotnil				17	Spotnil		Solquiet, Magquiet.
169	18	17	013	079	007	S05 W11	0	0	0	18	S05 W11	Q	Solquiet, Magquiet.
170	19	18	034	080	007	N29 E01	0	0	0	19	N29 E01	Q	Solquiet, Magalert
						S04 W24	0	0	0		S04 W24	Q	19/XX Disappearing
						S31 E67	1	0	0		S31 E67	Q	Filament.
171	20	19	023	080	016	N31 W11	1	0	0	20	N31 W11	Q	Solquiet, Magnil.
						S31 E55	0	0	0		S31 E55	Q	
172	21	20	035	079	008	S30 E43	0	0	0	21	S30 E43	Q	Solquiet, Magquiet.
						S20 W17	0	0	0		S20 W17	Q	
						N19 E41	0	0	0		N19 E41	Q	
173	22	21	034	080	007	S31 E30	0	0	0	22	S31 E30	Q	Solquiet, Magquiet.
						N19 E26	1	0	0		N19 E26	Q	
174	23	22	042	084	005	S31 E17	0	0	0	23	S31 E17	Q	Solquiet, Magquiet.
						N19 E13	4	0	0		N19 E13	Q	

ALERT PERIODS

INTERNATIONAL URSIGRAM AND WORLD DAYS SERVICE

Summary of the Geoalert Messages JUNE 1987

Julian Day	Date of Issue	Date of Observation	Wolf No.	10-cm Solar Flux	A-index	Location °Lat °Long	Flares Total	M	X	Date of Forecast	Location °Lat °Long	Region Forecast[1]	Geoalerts
175	24	23	041	085	005	S31 E05	0	0	0	24	S31 E05	Q	Solquiet, Magquiet.
						N19 W00	0	0	0		N19 W00	Q	
176	25	24	042	086	010	S31 W09	0	0	0	25	S31 W09	Q	Solquiet, Magquiet.
						N19 W15	3	0	0		N19 W15	Q	
177	26	25	043	084	010	S31 W21	0	0	0	26	S31 W21	Q	Solquiet, Magalert
						N19 W27	1	0	0		N19 W27	Q	Minor 26/26
						N30 E79	0	0	0		N30 E79	Q	Disappearing Filament.
178	27	26	041	082	009	S31 W35	4	0	0	27	S31 W35	Q	Solquiet, Magnil.
						N20 W40	1	0	0		N20 W40	Q	
						N29 E64	0	0	0		N29 E64	Q	
179	28	27	034	076	008	S32 W46	3	0	0	28	S32 W46	Q	Solquiet, Magquiet.
						N20 W56	1	0	0		N20 W56	Q	
						N29 E52	0	0	0		N29 E52	Q	
180	29	28	051	077	004	S32 W57	0	0	0	29	S32 W57	Q	Solquiet, Magquiet.
						N20 W68	0	0	0		N20 W68	Q	
						N28 E38	1	0	0		N28 E38	Q	
						S31 W32	0	0	0		S31 W32	Q	
181	30	29	026	074	005	N20 W82	0	0	0	30	N20 W82	Q	Solquiet, Magquiet.
						N29 E27	0	0	0		N29 E27	Q	
182	01	30	023	068	005	N22 W98	0	0	0	01	N22 W98	Q	Solquiet, Magquiet.
						N30 E14	0	0	0		N30 E14	Q	

[1]Q = quiet, E = eruptive, A = active, P = proton.

INTERNATIONAL RELATIVE SUNSPOT NUMBERS

Day	Final Jul 86	Aug	Sep	Oct	Nov	Dec	Final Jan 87	Feb	Mar	Prov Apr	May	Jun
01	0	12	9	12	44	0	19	0	13	14	35	15
02	0	11	9	14	35	0	15	0	23	12	40	11
03	11	11	8	23	37	0	13	0	15	10	22	0
04	14	11	8	24	37	0	12	0	16	13	23	0
05	18	11	0	24	35	0	11	0	24	28	22	10
06	29	10	11	22	31	0	10	0	23	47	27	0
07	29	8	13	27	24	0	11	0	24	56	29	0
08	29	9	12	20	15	0	0	0	22	64	25	0
09	17	8	10	32	10	12	0	0	14	69	23	0
10	36	0	8	29	9	20	0	7	11	72	25	0
11	39	0	8	23	9	23	0	0	9	80	23	11
12	36	0	0	26	0	22	0	0	0	77	19	21
13	25	0	0	22	14	24	0	0	0	79	22	14
14	16	0	0	0	12	13	8	8	10	74	13	10
15	28	0	0	0	12	0	9	7	11	78	35	9
16	26	9	0	11	12	11	0	0	11	60	47	12
17	28	8	0	16	12	9	13	0	22	41	64	15
18	14	0	0	22	12	0	13	0	21	36	46	24
19	13	0	0	31	12	0	9	0	12	29	62	13
20	18	11	0	39	12	0	9	0	12	16	46	22
21	21	12	0	47	11	11	14	7	15	19	41	29
22	22	12	0	57	10	16	20	7	17	26	35	38
23	14	14	0	71	18	16	23	0	19	25	36	38
24	0	9	0	76	12	13	14	0	19	35	35	38
25	0	9	0	68	0	9	13	7	16	23	37	38
26	0	9	0	60	0	0	14	9	12	21	34	41
27	12	9	0	65	13	0	13	8	11	11	31	33
28	13	9	0	61	0	0	20	8	12	14	19	41
29	17	9	8	63	8	0	15		13	20	12	25
30	19	9	9	62	0	0	14		15	30	12	16
31	17	9		50		11	11		15		10	
Mean	18.1	7.4	3.8	35.4	15.2	6.8	10.4	2.4	14.7	39.3	30.6	17.5

The yearly mean sunspot number equaled 13.4 in 1986.

Algonquin Radio Observatory — OTTAWA 2800 MHz (10.7 cm) SOLAR FLUX — Adjusted to 1 AU

Day	Jul 86	Aug	Sep	Oct	Nov	Dec	Jan 87	Feb	Mar	Apr	May	Jun
01	68.9	72.8	69.8	71.2	87.6*	70.7	71.6	69.2	72.8	72.5	79.3	77.8
02	68.7	72.3	69.2	71.6	84.1	70.6	70.5	69.8	73.3	71.9	80.2	77.9
03	68.9	72.9	69.3	72.1	80.8	70.2	69.1	70.0	71.6	72.4	82.8	76.4
04	69.3	71.6	69.4	70.7	82.3	69.2	69.0	68.3	73.3	74.0	84.4	77.3
05	71.1	71.7	69.6	71.1	81.5	70.0	70.3	67.5	73.7	77.6	86.1	76.1
06	73.9	72.1	69.5	72.4	80.6	69.1	69.3	67.7	75.6	89.4	87.9	75.8
07	72.1	71.9	69.9	74.3	76.9	68.2	69.7	69.1	75.5	94.4	88.1	76.0
08	71.6	71.3	69.4	74.8	73.5	69.1	68.2	68.9	76.9	94.8	89.1	77.0
09	72.5	71.3	69.4	74.6	71.9	70.8	68.0	69.2	73.6	100.5	87.3	76.8
10	75.0	70.5	69.3	73.3	70.4	72.3	67.4	69.3	71.4	100.0	89.5	78.1
11	74.7	68.6	68.8	73.2	69.9	73.0F	68.0	68.5	70.5	101.3	86.4	80.7
12	73.5	68.4	68.8	75.3	71.4	71.1	68.9	67.8	69.5	98.6	85.4	82.1
13	74.2	67.9	69.0	75.1	76.0*	71.5	69.7	68.0	69.6	99.3	87.4	82.3
14	74.6	68.2	70.0	75.0	74.1	71.4	71.1	68.3	71.1	97.7	91.2	80.6
15	74.0	69.5	71.5	71.8	75.1	70.9	71.5	69.3	70.5	97.8	93.6	80.4
16	74.4	69.4	70.5	79.1	75.0	70.8	70.7	68.4	71.0	95.3*	98.2	81.3
17	74.9	68.9	69.2	82.6	73.8	71.7	70.8	68.1	71.2	97.3	96.7	81.8
18	74.6	69.1	68.8	86.3	73.0	71.4	70.6	69.8	72.5	94.0	98.5	82.9
19	73.3	69.3	68.7	88.6	72.5	71.0	70.0	69.5	71.5	91.7	100.1	82.4
20	73.2	70.7	68.6	92.2	72.5	70.4	68.9	69.6	73.8	85.6	99.8	81.1
21	72.5	70.5	68.8	91.5	74.1	70.6	71.2*	70.7	74.2	78.3	99.9	82.6
22	73.2	70.1	68.3	94.4	74.5	71.4	73.6*	70.4	73.8	76.5	101.0	87.1
23	71.6	69.6	68.7	97.9	75.8	70.8	72.1	70.5	75.5	76.5	94.9	87.5
24	71.2	69.1	68.8	97.3	77.0	70.0	71.6	72.1	75.9	78.6	98.5	89.1
25	70.9	69.3	69.4	94.4	75.5	70.0	71.5	73.5	75.7	75.8	96.8	86.3
26	71.1	69.9	68.5	94.2	74.3	69.7	72.6	73.9	75.6	74.3	92.3	84.3
27	71.6	69.1	68.9	94.3	73.6	69.4	69.9	74.0	75.4	74.8	87.5	78.9
28	72.5	68.8	70.3	93.6	73.1	69.2	70.8	72.7*	75.0	74.3	85.1	79.2
29	74.0	68.8	71.5	91.4	72.4	69.2	70.6		75.3	73.6E	79.3	76.6
30	73.6	69.3	71.6	89.8	70.9	69.6	69.8		74.6	76.8	77.9	75.9H
31	72.6	69.6		89.2		68.1	68.7		71.9G		77.3	
Mean	72.5	70.1	69.4	82.4	75.5	70.4	70.2	69.8	73.3	85.5	89.8	80.4H

* = corrected for burst in progress; E = corrected for snow on antenna; F = uncorrected for interference during calibration; G = corrected for ice on antenna; H = measured at Penticton.
The yearly mean 2800 MHz flux equaled 74.0 in 1986.

DAILY SOLAR INDICES

June 1987

Day	Julian Day	Bartels Cycle Day	Sunspot Numbers Int	Sunspot Numbers Amer	Obs Flux Ottawa (2800)	Solar Flux Adjusted to 1 Astronomical Unit: SGMR (15400)	SGMR (8800)	SGMR (4995)	Ottawa (2800)	SGMR (2695)	PALE (1415)	SGMR (610)	SGMR (410)	SGMR (245)
01	152	27	15	15	75.6	---	---	---	77.8	--	64	--	--	--
02	153	1	11	11	75.7	361	221	94	77.9	69	64	32	19	8
03	154	2	0	8	74.2	502	232	119	76.4	79	63	35	20	8
04	155	3	0	0	75.1	466	204	113	77.3	76	67	33	16	8
05	156	4	10	8	73.9	486	219	119	76.1	76	63	37	20	9
06	157	5	0	0	73.6	500	245	120	75.8	81	64	35	19	9
07	158	6	0	0	73.8	492	242	119	76.0	79	64	20	18	9
08	159	7	0	0	74.8	481	225	120	77.0	81	67	34	20	9
09	160	8	0	0	74.5	494	237	121	76.8	77	73	30	19	16
10	161	9	0	0	75.8	501	254	121	78.1	80	68	39	20	9
11	162	10	11	13	78.3	456	263	123	80.7	84	69	37	20	10
12	163	11	21	23	79.6	456	263	123	82.1	84	70	37	20	10
13	164	12	14	10	79.7	485	219	125	82.3	84	71	32	20	10
14	165	13	10	9	78.1	481	209	119	80.6	82	69	32	20	10
15	166	14	9	10	77.9	488	---	121	80.4	79	70	32	20	9
16	167	15	12	11	78.8	490	---	121	81.3	78	71	38	21	8
17	168	16	15	20	79.3	501	---	120	81.8	82	71	34	19	10
18	169	17	24	24	80.3	490	214	117	82.9	82	71	29	19	9
19	170	18	13	15	79.8	487	236	122	82.4	82	70	38	19	9
20	171	19	22	22	78.5	498	240	122	81.1	82	70	29	18	10
21	172	20	29	27	80.0	485	262	120	82.6	83	70	35	20	10
22	173	21	38	40	84.3	468	248	130	87.1	88	72	40	22	13
23	174	22	38	37	84.7	478	253	129	87.5	88	73	43	21	11
24	175	23	38	37	86.3	498	247	122	89.1	90	72	32	21	14
25	176	24	38	39	83.5	491	254	134	86.3	87	79	14	11	9
26	177	25	41	39	81.5	499	265	127	84.3	88	70	25	13	10
27	178	26	33	40	78.3	462	202	110	78.9	79	67	13	8	8
28	179	27	41	35	76.6	496	244	120	79.2	80	66	37	16	10
29	180	1	25	22	74.1	496	251	121	76.6	78	64	38	18	9
30	181	2	16	17	73.4H	484	244	117	75.9H	76	63	31	20	9
Mean			17.5	17.7	77.6H	481	238	120	80.4H	81	68	32	18	9

All sunspot numbers shown above are preliminary values.

The observed and the adjusted Ottawa fluxes tabulated here are the "Series C" daily values reported by the Algonquin Radio Observatory, Ottawa, Ontario, Canada. Numbers in parentheses in the column headings denote frequencies in MHz.

H = measurement made at Penticton.

Equipment problems produced any gaps shown above in the Air Weather Service's Sagamore Hill (SGMR) observations.

OBSERVED AND PREDICTED SOLAR ACTIVITY INDICES

JUNE 1987

Date	RELATIVE SUNSPOT NUMBERS International (Ri) Monthly Mean	International (Ri) Smoothed	American (Ra) Monthly Mean	American (Ra) Smoothed	Derived (Rs) Monthly Mean	Derived (Rs) Smoothed	2800 MHz RADIO FLUX Adjusted to 1 AU (Sa) Monthly Mean	(Sa) Smoothed
Sep 83	50.3	68	47.4	66	57.0	67	110.2	119
Oct	55.8	68	52.3	66	58.6	67	111.7	120
Nov	33.3	59	30.2	65	35.6	67	90.4	120
Dec	33.4	64	32.3	62	35.7	65	90.5	118
Jan 84	57.0	60	54.4	58	59.4	61	112.4	115
Feb	85.4	56	81.5	54	86.2	58	137.2	101
Mar	83.5	53	83.0	51	68.5	55	120.8	108
Apr	69.7	50	66.5	48	78.1	52	129.7	105
May	76.4	48	72.1	45	79.6	49	131.1	103
Jun	46.1	46	45.2	44	49.8	48	103.5	102
Jul	37.4	44	36.2	42	37.6	39	92.2	99
Aug	25.5	40	24.5	38	30.7	41	85.8	95
Sep	15.7	34	13.6	32	23.2	35	78.9	90
Oct	12.0	29	9.8	27	16.9	31	73.1	86
Nov	22.8	25	19.4	23	18.6	26	74.6	72
Dec	18.7	22	17.0	20	17.4	23	73.5	79
Jan 85	16.5	20	14.5	19	15.9	21	72.1	77
Feb	15.9	20	16.3	18	15.7	20	71.9	76
Mar	17.2	19	11.8	16	16.3	19	72.5	75
Apr	16.2	18	17.1	17	19.8	19	75.7	75
May	27.5	18	24.0	17	26.6	19	82.0	75
Jun	24.2	18	22.2	16	22.8	19	78.5	75
Jul	30.7	17	30.8	16	25.8	19	81.3	75
Aug	11.1	17	10.7	15	17.2	19	73.3	75
Sep	3.9	17	3.4	16	13.8	20	70.2	76
Oct	18.6	17	16.5	16	18.1	20	74.2	76
Nov	16.2	17	16.4	15	16.4	19	72.6	75
Dec	17.3	15	10.1	14	16.2	19	72.4	75
Jan 86	2.5	14	2.3	12	14.6	18	70.9	74
Feb	23.2	13	23.8	11	26.0	17	81.5	74
Mar	15.1	13	12.5	11	20.3	17	76.2	73
Apr	18.5	14	13.8	12	19.6	18	75.6	74
May	13.7	14	11.6	12	18.1	18	74.2	74
Jun	1.1	14	0.8	11	13.3	18	69.7	74
Jul	18.1	14	17.7	11	16.3	18	72.5	74
Aug	7.4	13	7.6	11	13.7	17	70.1	73
Sep	3.8	12	3.5	10	13.0	17	69.4	73
Oct	35.4	13*	19.8	11	27.0	17	82.4	73
Nov	15.2	15*	14.7	13	19.5	18	75.5	74
Dec	6.8	16*	5.1	14	14.0	19	70.4	75
Jan 87	10.4	16(2)*	9.4	14	13.8	18	70.2	--
Feb	2.4	16(3)*	3.0	14	13.4	18	69.8	--
Mar	14.7	17(4)*	13.3	15	17.2	19	73.3	--
Apr	39.3†	18(4)*	37.9	16	30.3	21	85.5	--
May	30.6†	19(6)*	30.5	17	35.0	21	89.8	--
Jun	17.5†	21(7)*	17.7	19	24.8	23	80.4	--
Jul	----	22(9)*	----	20	----	25	----	--
Aug	----	23(11)*	----	22	----	26	----	--
Sep	----	25(12)*	----	24	----	27	----	--
Oct	----	28(15)*	----	26	----	30	----	--
Nov	----	31(19)*	----	30	----	34	----	--
Dec	----	36(21)*	----	34	----	39	----	--

*An asterisk marks either a value of the observed 12-month running mean or of a predicted 12-month average that is based in part on preliminary observations.

Underlined entries indicate predicted values and parentheses enclose the absolute value of the 90% confidence limits. The two columns headed "Derived" represent a sunspot number computed from a linear regression equation between the 2800 MHz solar flux (adjusted to 1 astronomical unit) and the Zurich sunspot number.

SMOOTHED (OBSERVED AND PREDICTED) SUNSPOT NUMBERS: CYCLES 21 AND 22

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1980	164	163	161	159	156	155	153	150	150	150	148	143
1981	140	142	143	143	143	142	140	141	143	142	139	138
1982	137	133	129	124	120	117	115	109	101	96	95	95
1983	93	90	86	82	77	71	66	66	68	68	67	64
1984	60	56	53	50	48	47	44	40	34	29	25	22
1985	21	20	19	18	18	18	17	17	17	17	17	15
1986	14	13	13	14	14	14	14	13	12*	13	15	16
1987	16	16	17	18	19	21	22	23	25	28	31	36
	(2)	(3)	(4)	(4)	(6)	(7)	(9)	(11)	(12)	(15)	(19)	(21)
1988	40	44	47	49	51	55	60	65	70	74	77	79
	(24)	(27)	(30)	(33)	(36)	(38)	(43)	(47)	(50)	(53)	(57)	(59)
1989	82	85	90	95	102	109	113	116	119	122	123	124
	(59)	(59)	(62)	(65)	(67)	(70)	(71)	(73)	(77)	(80)	(81)	(82)
1990	124	126	126	123	121	120	120	120	121	121	118	117
	(82)	(83)	(81)	(77)	(70)	(64)	(61)	(60)	(55)	(49)	(43)	(38)

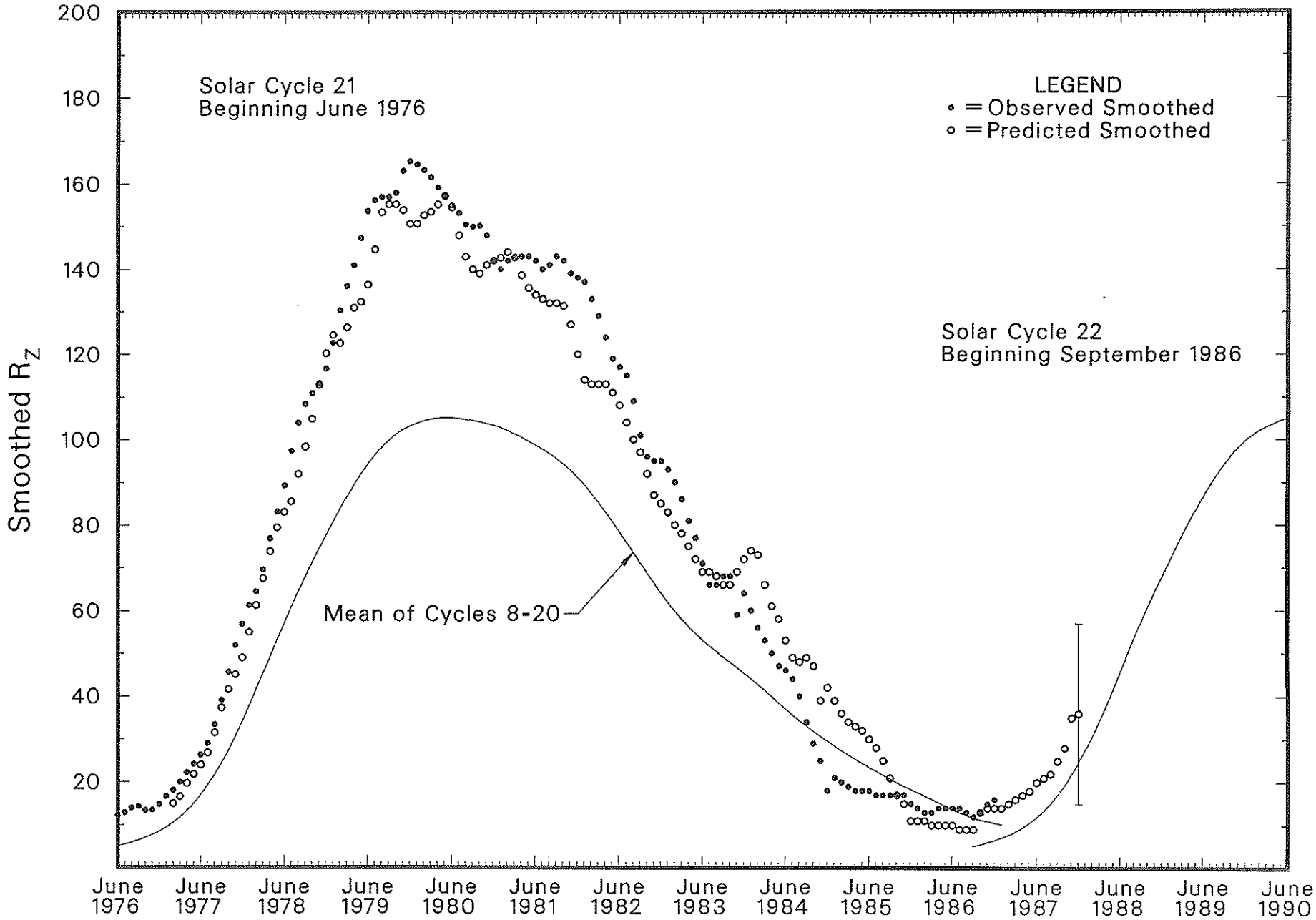
*September 1986 may be the onset of Sunspot Cycle 22.

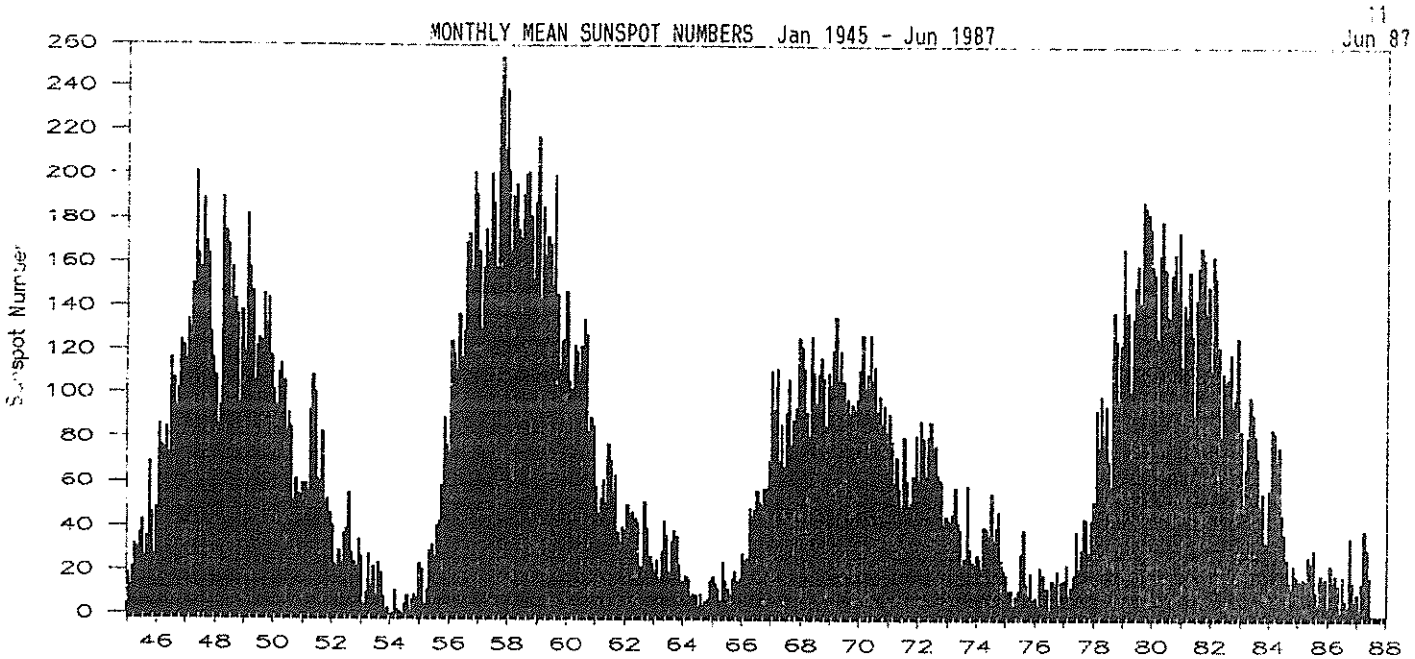
For the end of Solar Cycle 21, and perhaps the beginning of Cycle 22, the table gives observed smoothed sunspot numbers up to the one calculated from the most recently measured monthly mean. These smoothed observed values are based on final, unsmoothed monthly means through March 1987 and on provisional numbers thereafter.

Table entries, with numbers in parentheses below them, denote predictions by the McNish-Lincoln method. (See page 9 in the March 1986 supplement to Solar-Geophysical Data.) Adding the number in parentheses to the predicted value generates the upper limit of the 90% confidence interval; subtracting the number from the predicted value generates the lower limit. Consider, for example, the December 1987 prediction. There exists a 90% chance that in December 1987 the actual smoothed sunspot number will fall somewhere between 15 and 57.

THE MCNISH-LINCOLN PREDICTION METHOD GENERATES USEFUL ESTIMATES OF SMOOTHED, MONTHLY MEAN SUNSPOT NUMBERS FOR NO MORE THAN 12 MONTHS AHEAD. Beyond a year the predictions regress rapidly toward the mean of all 14 cycles used in the computation. Moreover, the method is very sensitive to the date defined as the beginning of the current sunspot cycle, that is, to the date of the most recent sunspot minimum. The new-cycle predictions tabulated above are based on the assumption that the September 1986 value of 12.3 is the minimum. If a smoothed number lower than 12.3 occurs, the predictions will change.

OBSERVED AND ONE-YEAR-AHEAD PREDICTED SUNSPOT NUMBERS





Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Mean
1945	18.5	12.7	21.5	32.0	30.6	36.2	42.6	25.9	34.9	68.8	46.0	27.4	33.2
1946	47.6	86.2	76.6	75.7	84.9	73.5	116.2	107.2	94.4	102.3	123.8	121.7	92.6
1947	115.7	133.4	129.8	149.8	201.3	163.9	157.9	188.8	169.4	163.6	128.0	116.5	151.6 M
1948	108.5	86.1	94.8	189.7	174.0	167.8	142.2	157.9	143.3	136.3	95.8	138.0	136.3
1949	119.1	182.3	157.5	147.0	106.2	121.7	125.8	123.8	145.3	131.6	143.5	117.6	134.7
1950	101.6	94.8	109.7	113.4	106.2	83.6	91.0	85.2	51.3	61.4	54.8	54.1	83.9
1951	59.9	59.9	55.9	92.9	108.5	100.6	61.5	61.0	83.1	51.6	52.4	45.8	69.4
1952	40.7	22.7	22.0	29.1	23.4	36.4	39.3	54.9	28.2	23.8	22.1	34.3	31.5
1953	26.5	3.9	10.0	27.8	12.5	21.8	8.6	23.5	19.3	8.2	1.6	2.5	13.9
1954	0.2	0.5	10.9	1.8	0.8	0.2	4.8	8.4	1.5	7.0	9.2	7.6	4.4 m
1955	23.1	20.8	4.9	11.3	28.9	31.7	26.7	40.7	42.7	58.5	89.2	76.9	38.0
1956	73.6	124.0	118.4	110.7	136.6	116.6	129.1	169.6	173.2	155.3	201.3	192.1	141.7
1957	165.0	130.2	157.4	175.2	164.6	200.7	187.2	158.0	235.8	253.8	210.9	239.4	190.2 M
1958	202.5	164.9	190.7	196.0	175.3	171.5	191.4	200.2	201.2	181.5	152.3	187.6	184.8
1959	217.4	143.1	185.7	163.3	172.0	168.7	149.6	199.6	145.2	111.4	124.0	125.0	159.0
1960	146.3	106.0	102.2	122.0	119.6	110.2	121.7	134.1	127.2	82.8	89.6	85.6	112.3
1961	57.9	46.1	53.0	61.4	51.0	77.4	70.2	55 8	63.6	37.7	32.6	39.9	53.9
1962	38.7	50.3	45.6	46.4	43.7	42.0	21.8	21.8	51.3	39.5	26.9	23.2	37.6
1963	19.8	24.4	17.1	29.3	43.0	35.9	19.6	33.2	38.8	35.3	23.4	14.9	27.9
1964	15.3	17.7	16.5	8.6	9.5	9.1	3.1	9.3	4.7	6.1	7.4	15.1	10.2 m
1965	17.5	14.2	11.7	6.8	24.1	15.9	11.9	9.9	16.8	20.1	15.8	17.0	15.1
1966	28.2	24.4	25.3	48.7	45.3	47.7	56.7	51.2	50.2	57.2	57.2	70.4	47.0
1967	110.9	93.6	111.8	69.5	86.5	67.3	91.5	107.2	76.8	88.2	94.3	126.4	93.8
1968	121.8	111.9	92.2	81.2	127.2	110.3	96.1	109.3	117.2	107.7	86.0	109.8	105.9 M
1969	104.4	120.5	135.8	106.8	120.0	106.0	96.8	98.0	91.3	95.7	93.5	97.9	105.5
1970	111.5	127.8	102.9	109.5	127.5	106.8	112.5	93.0	99.5	86.6	95.2	83.5	104.5
1971	91.3	79.0	60.7	71.8	57.5	49.8	81.0	61.4	50.2	51.7	63.2	82.2	66.6
1972	61.5	88.4	80.1	63.2	80.5	88.0	76.5	76.8	64.0	61.3	41.6	45.3	68.9
1973	43.4	42.9	46.0	57.7	42.4	39.5	23.1	25.6	59.3	30.7	23.9	23.3	38.0
1974	27.6	26.0	21.3	40.3	39.5	36.0	55.8	33.6	40.2	47.1	25.0	20.5	34.5
1975	18.9	11.5	11.5	5.1	9.0	11.4	28.2	39.7	13.9	9.1	19.4	7.8	15.5
1976	8.1	4.3	21.9	18.8	12.4	12.2	1.9	16.4	13.5	20.6	5.2	15.3	12.6 m
1977	16.4	23.1	8.7	12.9	18.6	38.5	21.4	30.1	44.0	43.8	29.1	43.2	27.5
1978	51.9	93.6	76.5	99.7	82.7	95.1	70.4	58.1	138.2	125.1	97.9	122.7	92.5
1979	166.6	137.5	138.0	101.5	134.4	149.5	159.4	142.2	188.4	186.2	183.3	176.3	155.4 M
1980	159.6	155.0	126.2	164.1	179.9	157.3	136.3	135.4	155.0	164.7	147.9	174.4	154.6
1981	114.0	141.3	135.5	156.4	127.5	90.9	143.8	158.7	167.3	162.4	137.5	150.1	140.4
1982	111.2	163.6	153.8	122.0	82.2	110.4	106.1	107.6	118.8	94.7	98.1	127.0	115.9
1983	84.3	51.0	66.5	80.7	99.2	91.1	82.2	71.8	50.3	55.8	33.3	33.4	66.6
1984	57.0	85.4	83.5	69.7	76.4	46.1	37.4	25.5	15.7	12.0	22.8	18.7	45.9
1985	16.5	15.9	17.2	16.2	27.5	24.2	30.7	11.1	3.9	18.6	16.2	17.3	17.9
1986	2.5	23.2	15.1	18.5	13.7	1.1	18.1	7.4	3.8	35.4	15.2	6.8	13.4
1987	10.4	2.4	14.7	39.3*	30.6*	17.5*							19.5*

*Preliminary

For the yearly means, each "M" marks a sunspot cycle maximum and each "m" a minimum.

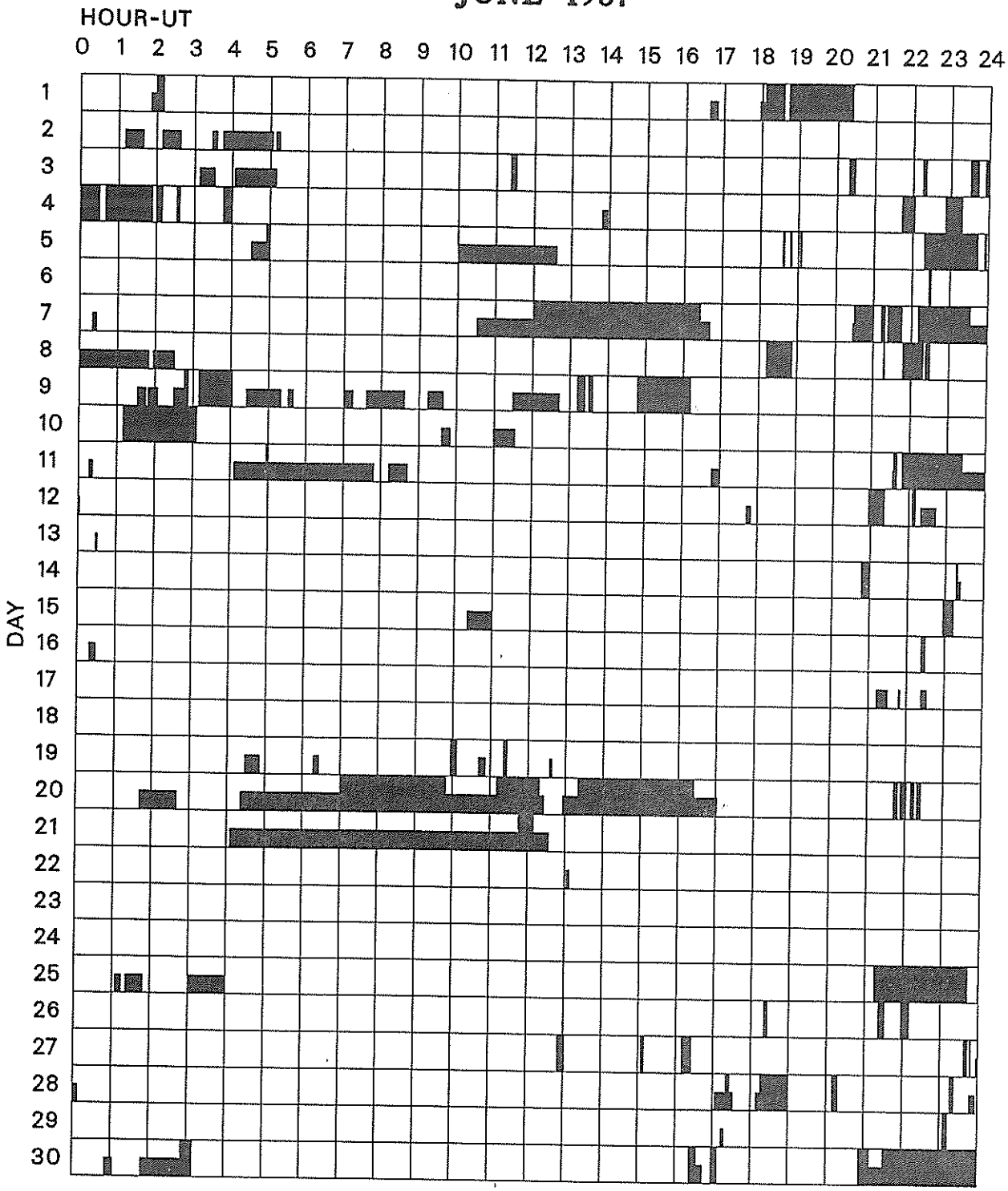
H - ALPHA S O L A R F L A R E S

JUNE 1987

Grp #	Sta	Day	Start (UT)	Max (UT)	End (UT)	Lat	CMD	NOAA/ USAF Region	CMP Mo	CMP Day	Dur (Min)	Imp Opt	Imp Xray	See	Obs Type	Area Measurement Time (UT)	Apparent (10^{-6} Disk)	Corr (Sq Deg)	Remarks
0001	SVTO	14	0844	0844	0914	N28	E52	4815	06	18.4	30	SF		3	C		15		F
0002	HOLL	18	0034	0036	0044	S29	E69		06	23.4	10	SF		3	C		18		
0003	PALE	19	0415E	0421U	0435	N37	W06	4815	06	18.7	20D	SF		2	C		14		F
0004	SVTO	21	0423	0424	0443D	N18	E36	4819	06	23.9	20D	SF		1	C		58		H
0005	PALE	22	0300	0301	0304	N20	E26	4819	06	24.1	4	SF		3	C		18		
0006	YUNN	22	0831E	0833U	0834D	N18	E21	4819	06	23.9	3D	SN			P	0833	110	1.3	E
0007	YUNN	22	0831E	0833U	0834D	S33	E30	4817	06	24.7	3D	SN			P	0833	24	.3	D
0008	KAND	22	1120		1227	N19	E23	4819	06	24.2	67	SN			P		31	.4	DT
0009	KAND	22	1159		1208	N18	E24	4819	06	24.3	9	SF			P		21	.2	DT
0010	KAND	22	1217	1232	1245	N19	E23	4819	06	24.3	28	SN			P		73	.9	DT
0011	HOLL	22	1338	1347	1352	N16	E19	4819	06	24.0	14	SF		3	C		23		
0012		22	17142	17161	1728	N19	E19	4819	06	24.2	14	SN					30		H
	HOLL	22	1714	1717	1733	N19	E19	4819	06	24.2	19	SN		3	C		47		
	PALE	22	1716	1716	1722	N19	E19	4819	06	24.2	6	SF		3	C		13		H
0013	HOLL	22	2018	2023	2034	N18	E15	4819	06	24.0	16	SN		3	C		33		
0014	YUNN	23	0648	0649	0657	N19	E09	4819	06	24.0	9	SN			C		63	.7	E
0015	HOLL	24	0029	0032	0048	N18	E00	4819	06	24.0	19	SN		3	C		39		
0016		24	0500	0500	0514	N18	W04	4819	06	23.9	14	SN					50		F
	SVTO	24	0500	0500	0513	N18	W06	4819	06	23.7	13	SN		3	C		38		F
	LEAR	24	0501E	0501U	0516	N18	W03	4819	06	24.0	15D	SF		3	C		61		
0017	LEAR	24	0530	0530	0537	N18	W01	4819	06	24.1	7	SF		3	C		38		
0018	HOLL	25	1854	1908	1915	N22	W26	4819	06	23.8	21	SF		3	C		41		F
		25	2115		2342	No Flare Patrol													
0019		26	0332E	0339U	0349	S32	W20	4817	06	24.6	17D	SF					26		H
	PALE	26	0332E	0339U	0339D	S32	W21	4817	06	24.5	7D	SF		3	C		20		H
	LEAR	26	0342E		0349	S32	W18	4817	06	24.7	7D	SF		3	C		31		
0020	LEAR	26	0721E	0723	0729	N19	W30	4819	06	24.0	8D	SF		3	C		31		
0021		26	08503	0900	0925	S32	W24	4817	06	24.5	35	SN					49		DF
	KAND	26	0850		0851D	S33	W25	4817	06	24.4	1D	SN			P				D
	SVTO	26	0853	0900	0925	S32	W22	4817	06	24.6	32	SN		3	C		49		F
0022	HOLL	26	1319	1327	1334	N19	W49	4819	06	22.8	15	SF		3	C		29		
0023	PALE	26	1900	1903	1913	S33	W22	4817	06	25.0	13	SN		3	C		36		
0024	HOLL	26	2223	2224	2230	S33	W23	4817	06	25.1	7	SF		3	C		24		
0025	RAMY	27	1051E	1051U	1124	S33	W36	4817	06	24.6	33D	SN		2	C		92		U
0026	RAMY	27	1319	1327	1334	N19	W49	4819	06	23.8	15	SF		3	C		29		
0027	RAMY	27	1428	1430	1440	S32	W39	4817	06	24.5	12	SF		3	C		23		F
0028	PALE	27	2228	2237	2247	S30	W44	4817	06	24.5	19	SF		3	C		28		
0029	RAMY	28	2220	2221	2224	N30	E45	4820	07	2.5	4	SF		3	C		26		

INTERVALS OF NO FLARE PATROL OBSERVATION
FOR PRECEDING SOLAR FLARE TABLE

JUNE 1987



Times of no flare patrol, shown here as shaded areas, combine reports from the observatories listed below. Portions of a panel completely shaded mark dates and times of no patrol of any kind, that is, of neither visual nor cinematographic; portions of a panel with only the bottom half shaded mark times of strictly visual patrol.

Athens	Istanbul	Learmonth	Peking	San Vito
Holloman	Kandilli	Palehua	Purple Mt.	Urumqi
			Ramey	Yunnan

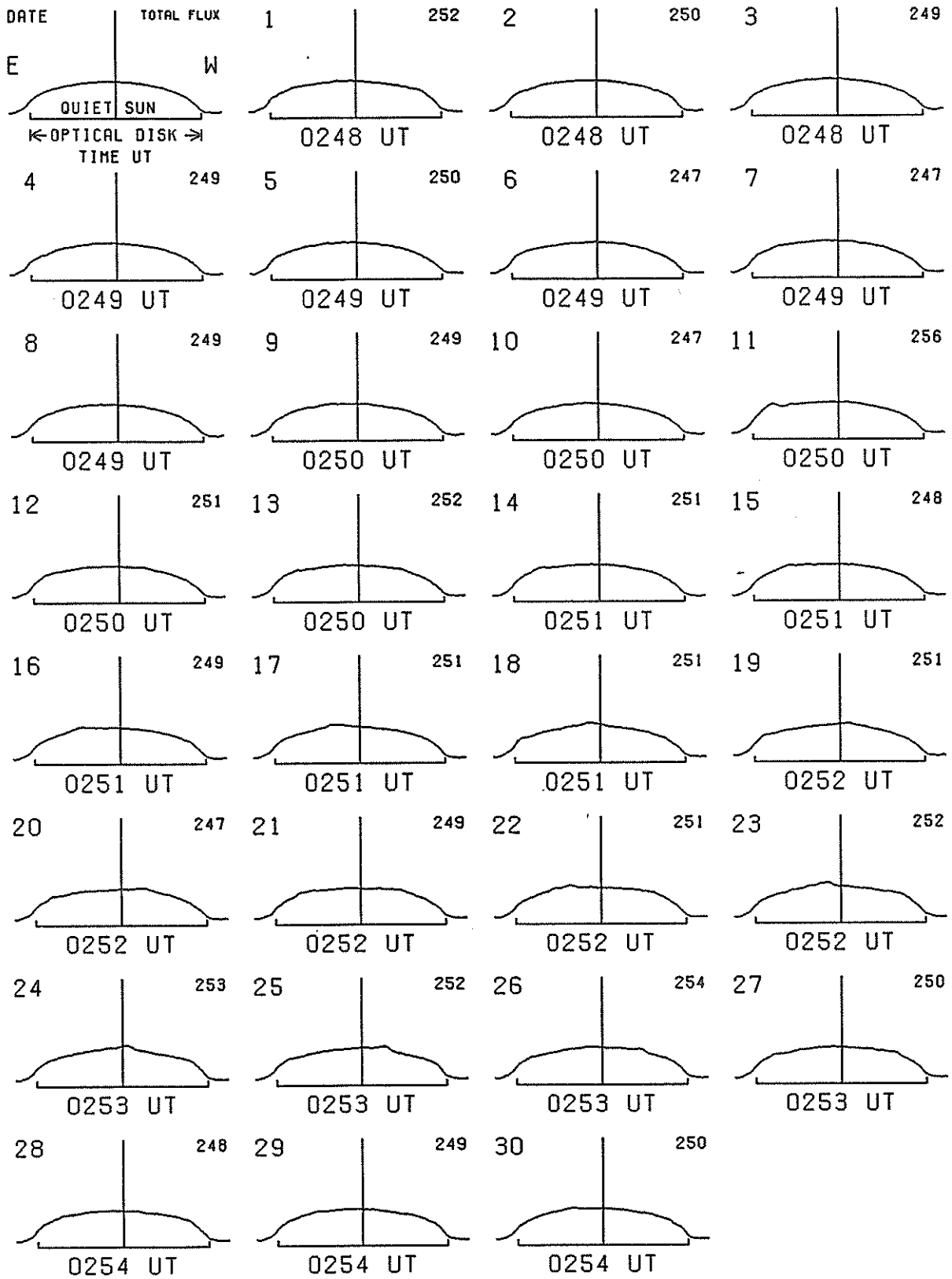
14
Jun 87

EAST-WEST SOLAR SCANS

JUNE 1987

TOYOKAWA, JAPAN

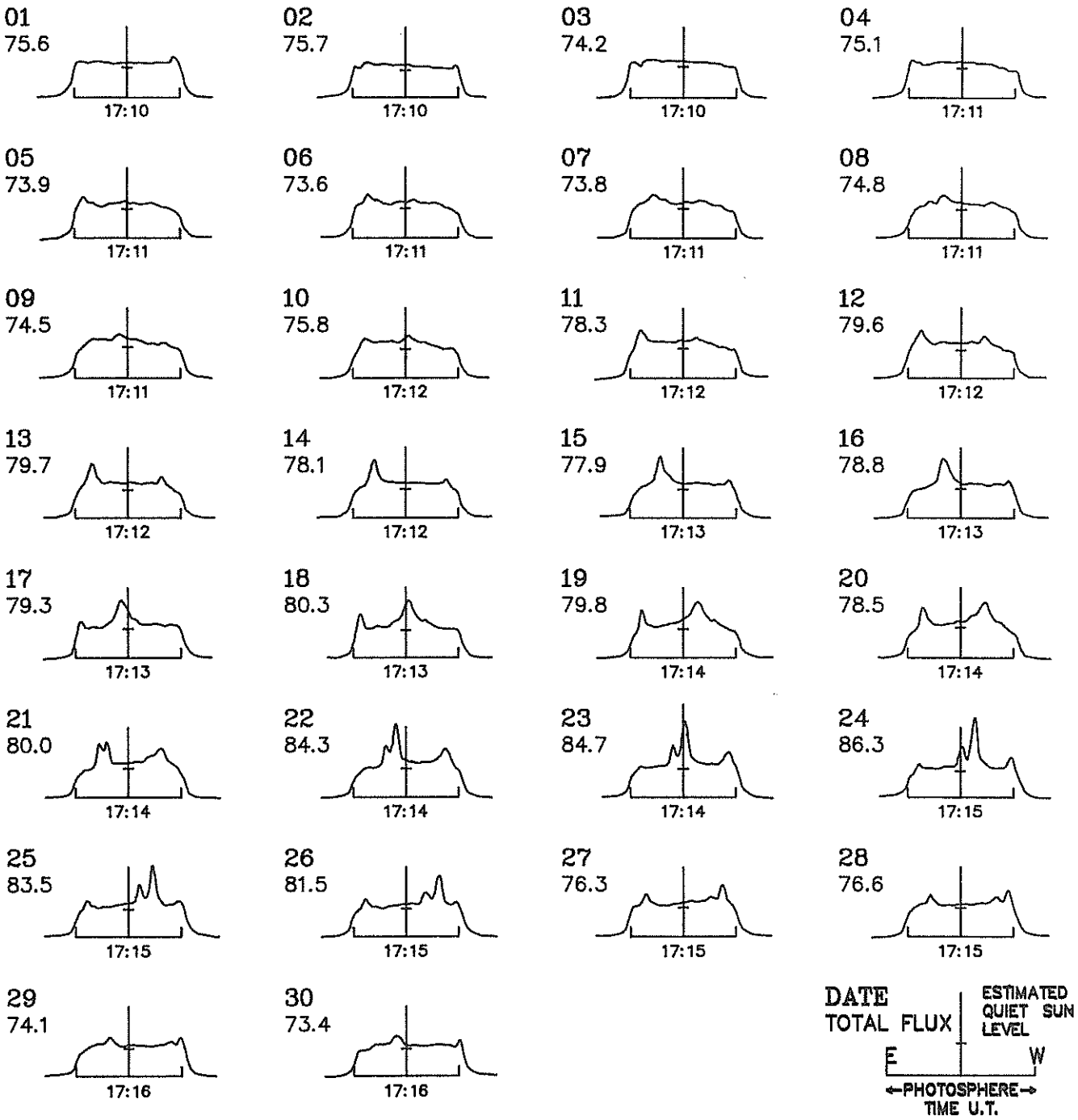
3 CM
FAN BEAM WITH 1.1 MINUTES OF ARC



EAST – WEST SOLAR SCANS
JUNE 1987

ALGONQUIN RADIO OBSERVATORY
CANADA

10.7 cm
Fan Beam with 1.5 minutes of arc
E – W Resolution

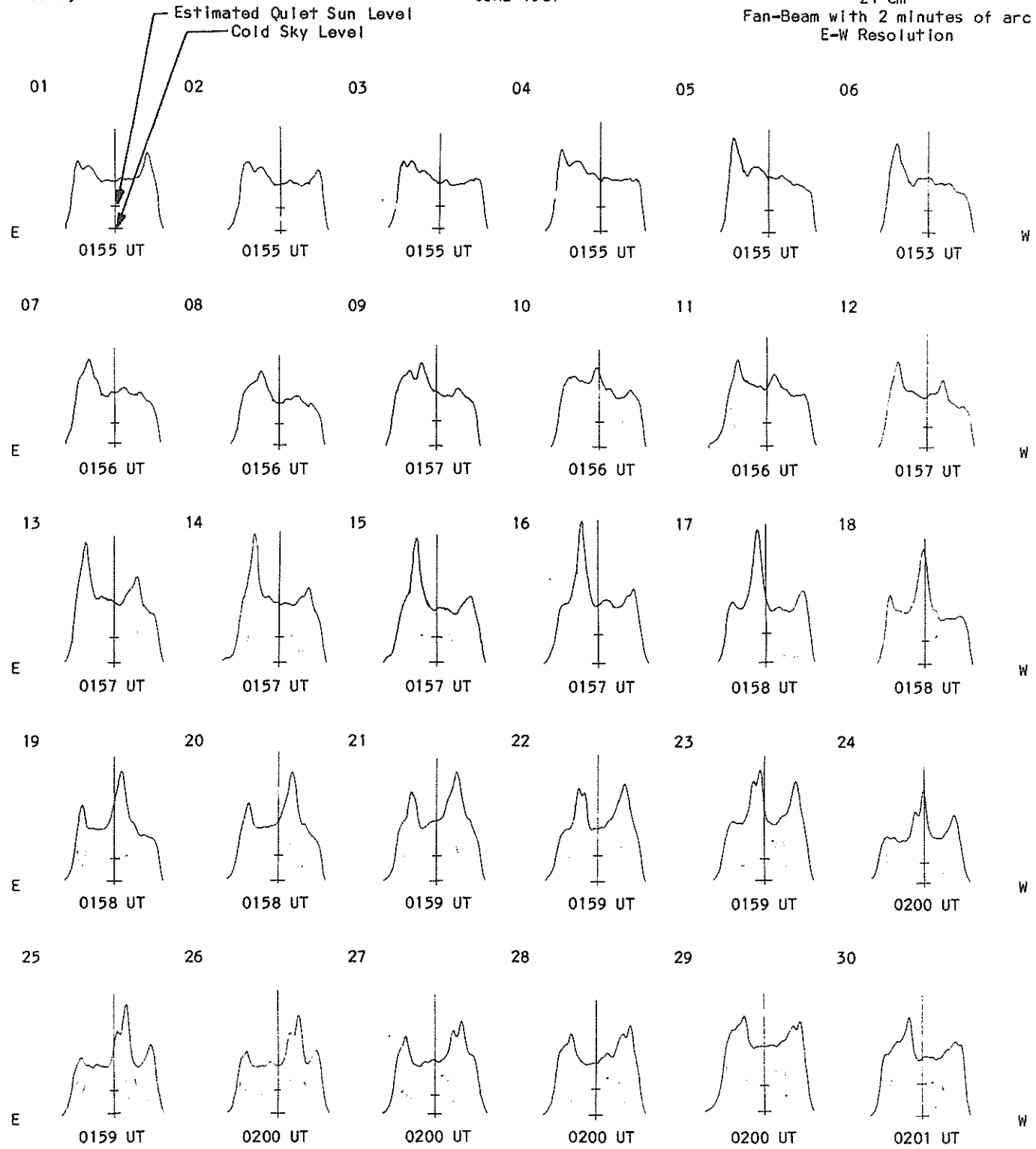


EAST-WEST SOLAR SCANS

Fleurs, Australia

JUNE 1987

21 cm
Fan-Beam with 2 minutes of arc
E-W Resolution

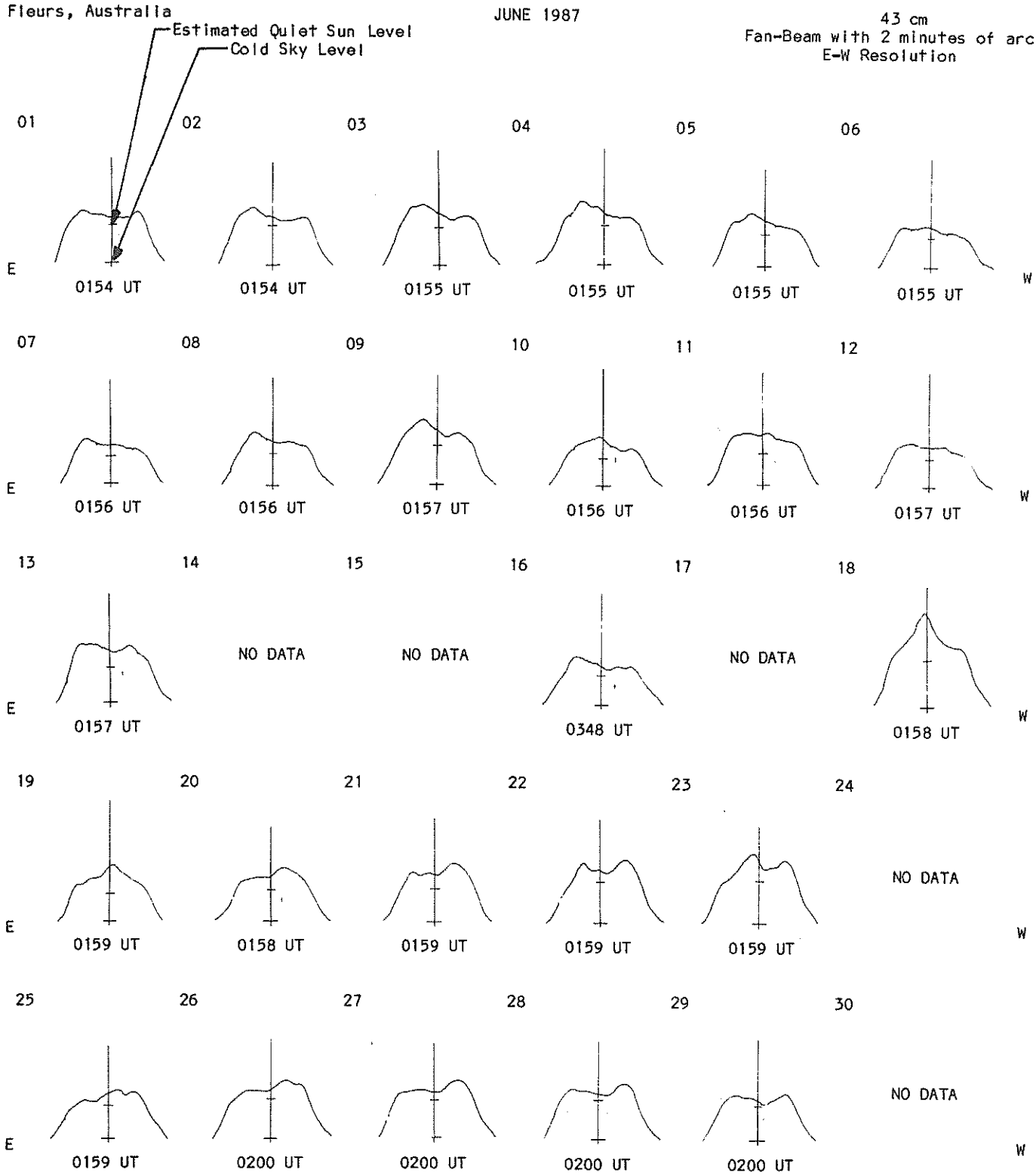


E A S T - W E S T S O L A R S C A N S

Fleurs, Australia

JUNE 1987

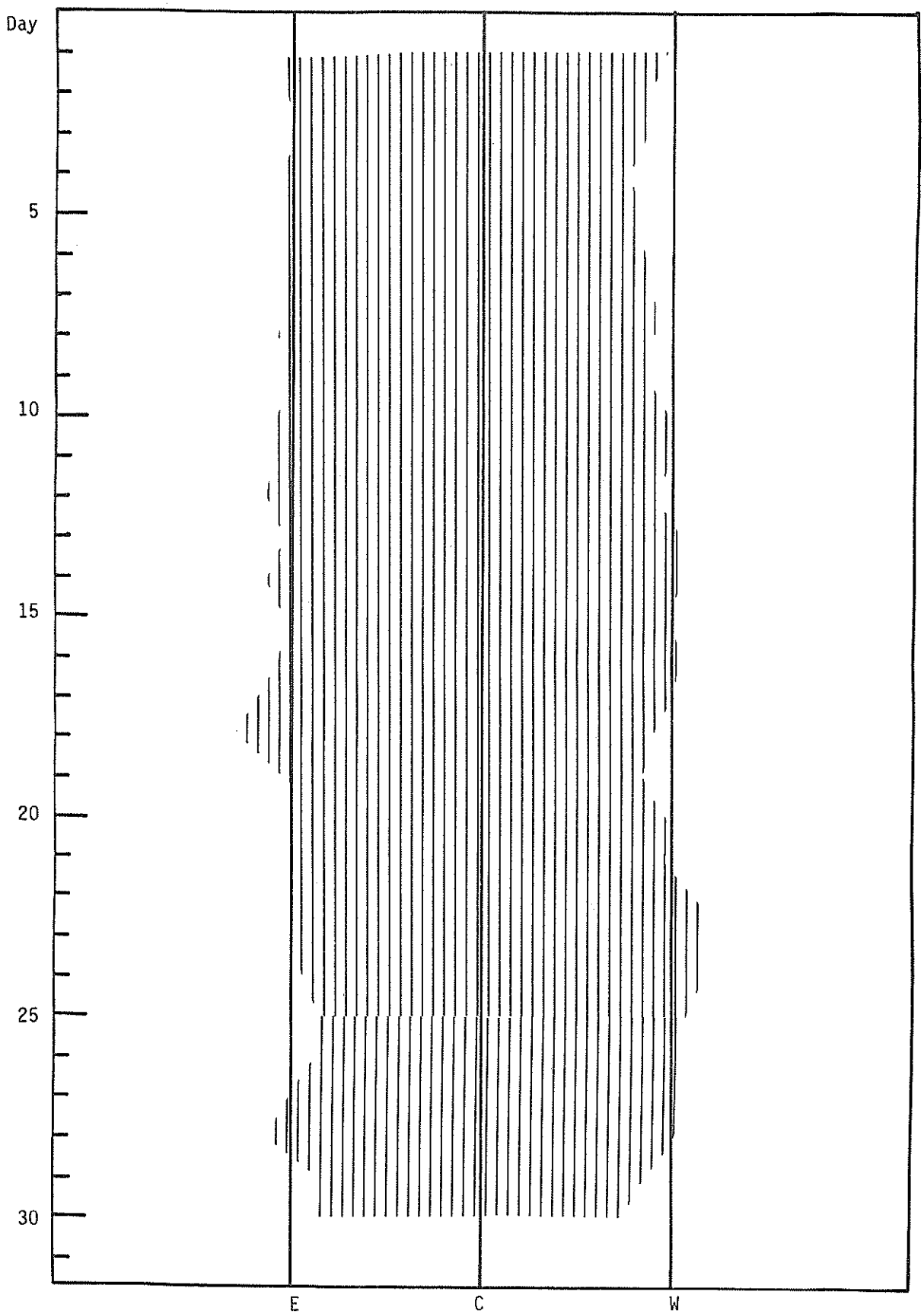
43 cm
Fan-Beam with 2 minutes of arc
E-W Resolution



18
Jun 87

SOLAR INTERFEROMETRIC OBSERVATIONS

Nancay JUNE 1987 164 MHz



SOLAR RADIO EMISSION
SELECTED FIXED FREQUENCY EVENTS

JUNE 1987

Day	Freq Sta	Type	Start (UT)	Time of Maximum (UT)	Duration (Min)	Flux Density Peak (10 -22 W/m 2 Hz)	Flux Density Mean (10 -22 W/m 2 Hz)	Int	Remarks
14	2800 OTTA	1 S	2117.0	2118.2	8.0	1.5	7		
21	2800 OTTA	20 GRF	1710.0		520.0D	4.0			

Observatories

ATHN = Athens
BERN = Berne
LEAR = Learmonth
MANI = Manila
OTTA = Ottawa
PALE = Palehua
PENT = Penticton
SGMR = Sagamore Hill
SVTO = San Vito

Explanation of Type Code:

1 Simple 1
2 Simple 1F
3 Simple 2
4 Simple 2F
5 Simple
6 Minor
7 Minor +
8 Spike
20 Simple 3
21 Simple 3A
22 Simple 3F
23 Simple 3AF
24 Rise
25 Rise A
26 Fall
27 Rise and Fall
28 Precursor
29 Post Burst Increase
30 Post Burst Increase A
31 Post Burst Decrease
33 Absorption
40 Fluctuation
41 Group of Bursts
42 Series of Bursts
43 Onset of Noise Storm
44 Noise Storm in Progress
45 Complex
46 Complex F
47 Great Burst
48 Major
49 Major +

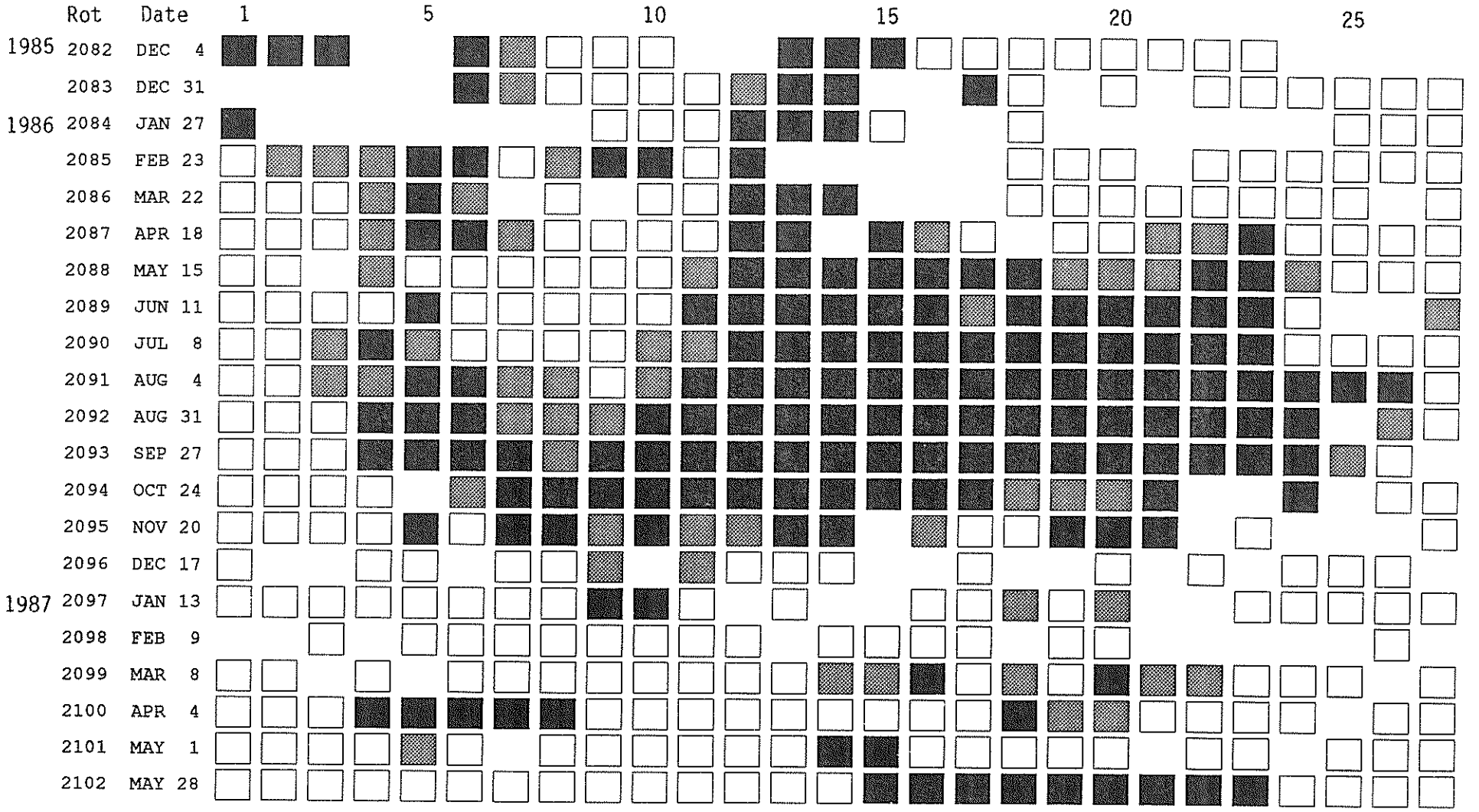
Remarks:
QL = Quality (1=poor to 6=excellent)
ST = Status (1=real time; 2=final; 3=correction; 4=deletion)
TYP= Type (1=noise storm;2=rise in base level;3=minor;4=group;5=major;6=major plus;7=Castelli U-type burst)

STANFORD MEAN SOLAR MAGNETIC FIELD (MICROTESLA)

Day	1986 Jul	Aug	Sep	Oct	Nov	Dec	1987 Jan	Feb	Mar	Apr	May	Jun
1	-6	3	4	-7	-11	-1	·	1	·	10	14	2
2	-5	7	5	-7	-11	-10	11	·	·	·	17	3
3	-7	4	-6	-6	-12	-11	·	·	·	8	11	12
4	2	10	-6	1	-5	·	·	9	·	13	5	23
5	·	10	-3	-7	-10	0	6	10	·	10	0	27
6	·	0	0	-6	-7	20	·	14	9	2	3	24
7	-1	-2	-2	-12	-7	4	9	16	·	-5	·	29
8	10	-5	-1	-15	-5	-9	·	15	14	-14	6	38
9	4	-4	-9	-11	-4	-4	12	·	15	-13	6	31
10	1	-2	-14	-15	-2	-5	13	·	·	-12	5	8
11	-5	1	-16	-18	-2	·	16	10	10	-5	20	-8
12	0	3	-17	-10	-2	4	·	·	·	5	17	-17
13	3	-1	-18	-8	-5	·	20	14	10	18	5	-19
14	5	-12	-19	-9	·	·	25	8	23	30	-6	-21
15	5	-17	-15	-10	·	·	23	7	18	30	-4	-21
16	2	-21	-10	-10	-21	14	17	15	22	25	2	-16
17	-2	-23	-11	-15	·	23	13	13	22	19	4	-12
18	-2	-21	-11	-21	6	·	11	11	17	13	3	-16
19	-7	-18	-13	-10	13	·	15	12	13	6	4	-6
20	-23	-13	-14	-7	19	22	11	11	7	2	7	9
21	-21	-14	-15	1	34	6	-6	·	-1	-3	·	13
22	-26	-13	-13	7	29	·	-4	2	1	-2	19	12
23	-16	-15	-9	·	15	9	9	2	-3	1	21	7
24	-12	-8	·	33	-3	8	·	5	2	2	·	7
25	-8	-16	1	14	3	0	7	4	0	6	3	11
26	-7	-9	4	11	-9	·	·	·	3	8	8	6
27	-4	-9	6	6	-8	1	·	4	-3	10	8	-1
28	-5	-8	9	·	0	9	3	6	-2	·	12	4
29	-3	-3	3	-1	-12	3	5		-1	12	17	-1
30	-22	5	-3	-6	-2	5	-2		7	12	16	5
31	2	12		-9		·	5		12		4	

Dot symbol indicates no data available for the day.

STANFORD MEAN SOLAR MAGNETIC FIELD



Mean Solar Magnetic Field Polarity: □ = field > 2 microT; ▒ = -2 microT ≤ field ≤ 2 microT

■ = field <-2 microT; No box = no data available

Observations are taken at 2000 UT. Rotation numbers given are the Bartels series, but the dates are not; these dates mark times of occurrence of phenomena on the Sun that affect the Earth during the given Bartels Rotation.

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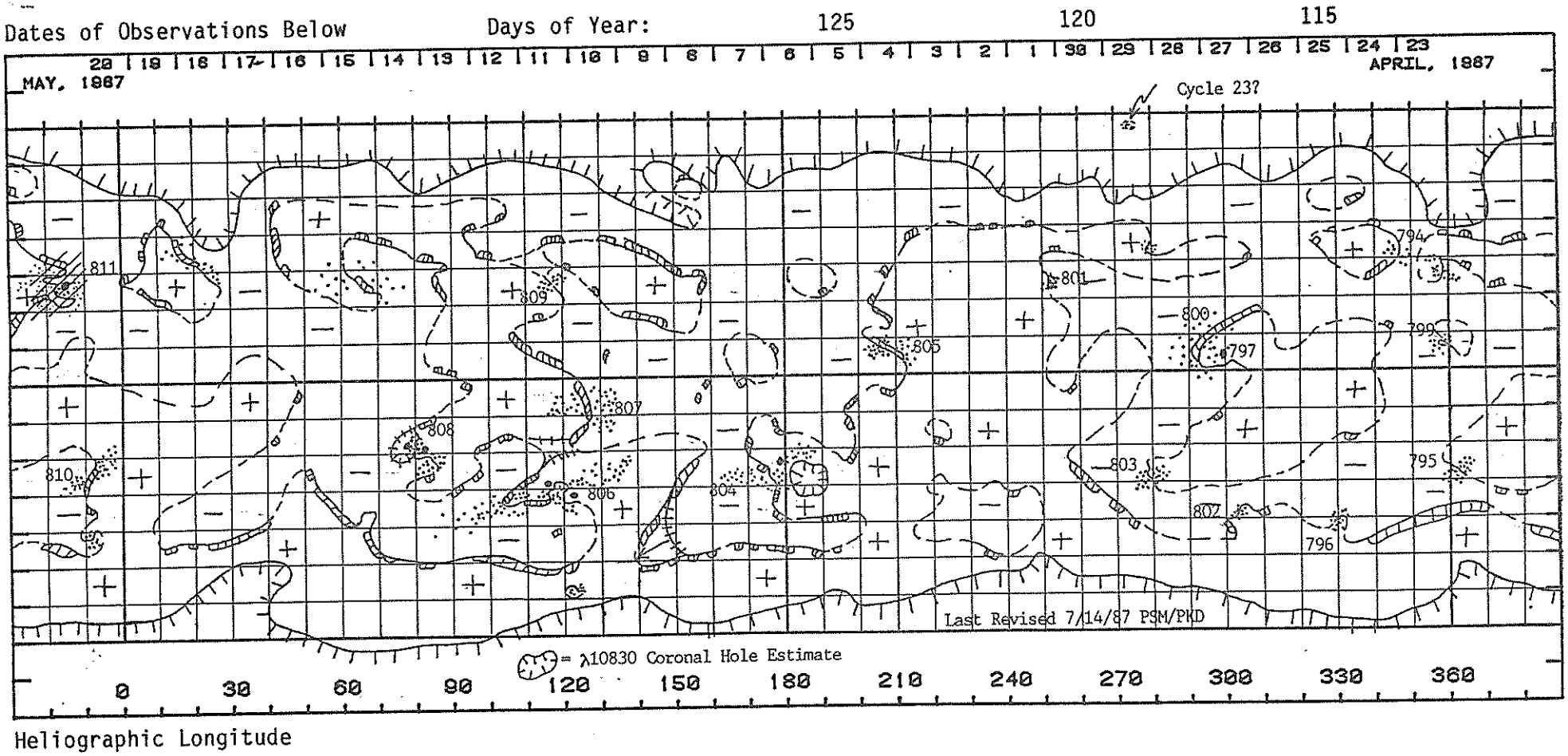
PRELIMINARY H-ALPHA SOLAR SYNOPTIC CHART

CARRINGTON ROTATION NUMBER 1788

(23 April to 20 May 1987)

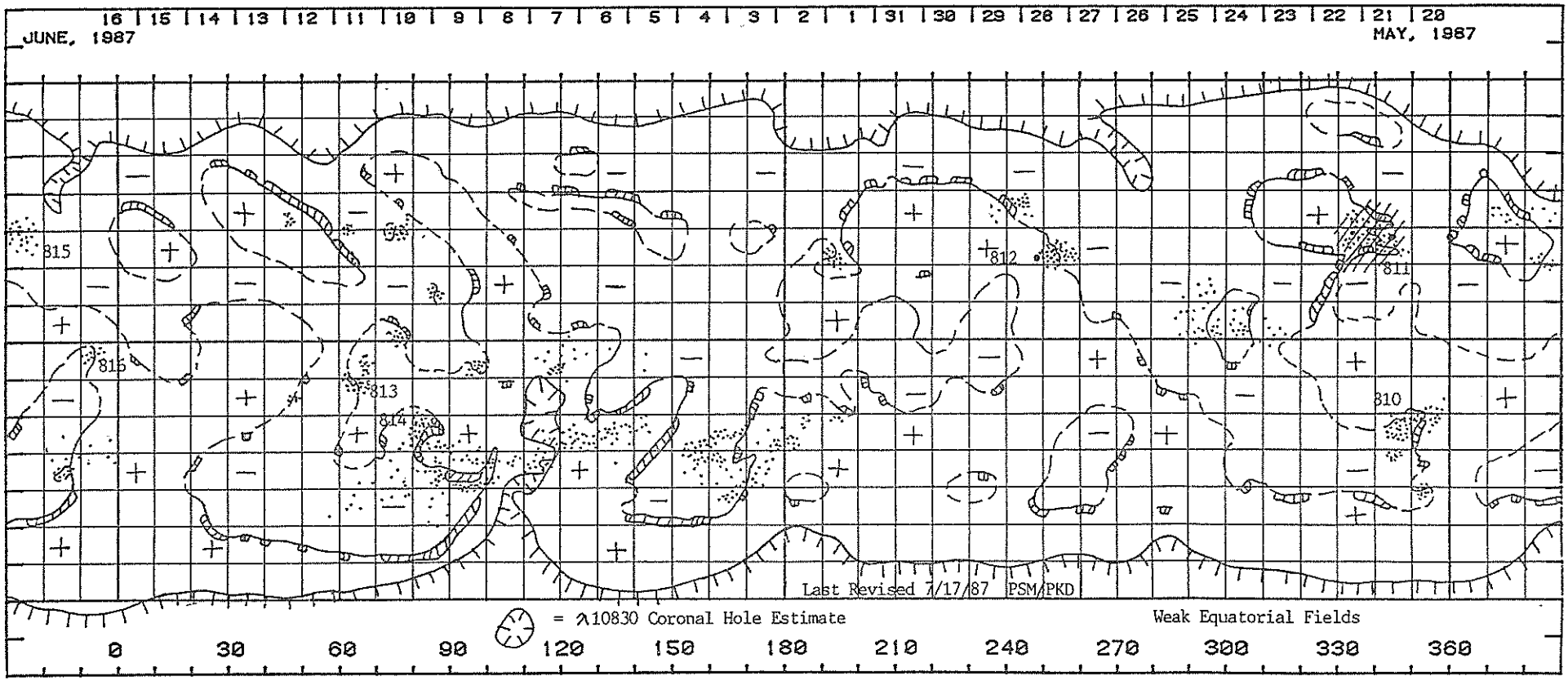


P R E L I M I N A R Y H - ALPHA S O L A R S Y N O P T I C C H A R T

CARRINGTON ROTATION NUMBER 1789

(20 May to 16 June 1987)

Dates of Observations Below Days of Year: 153 148 143



Heliographic Longitude

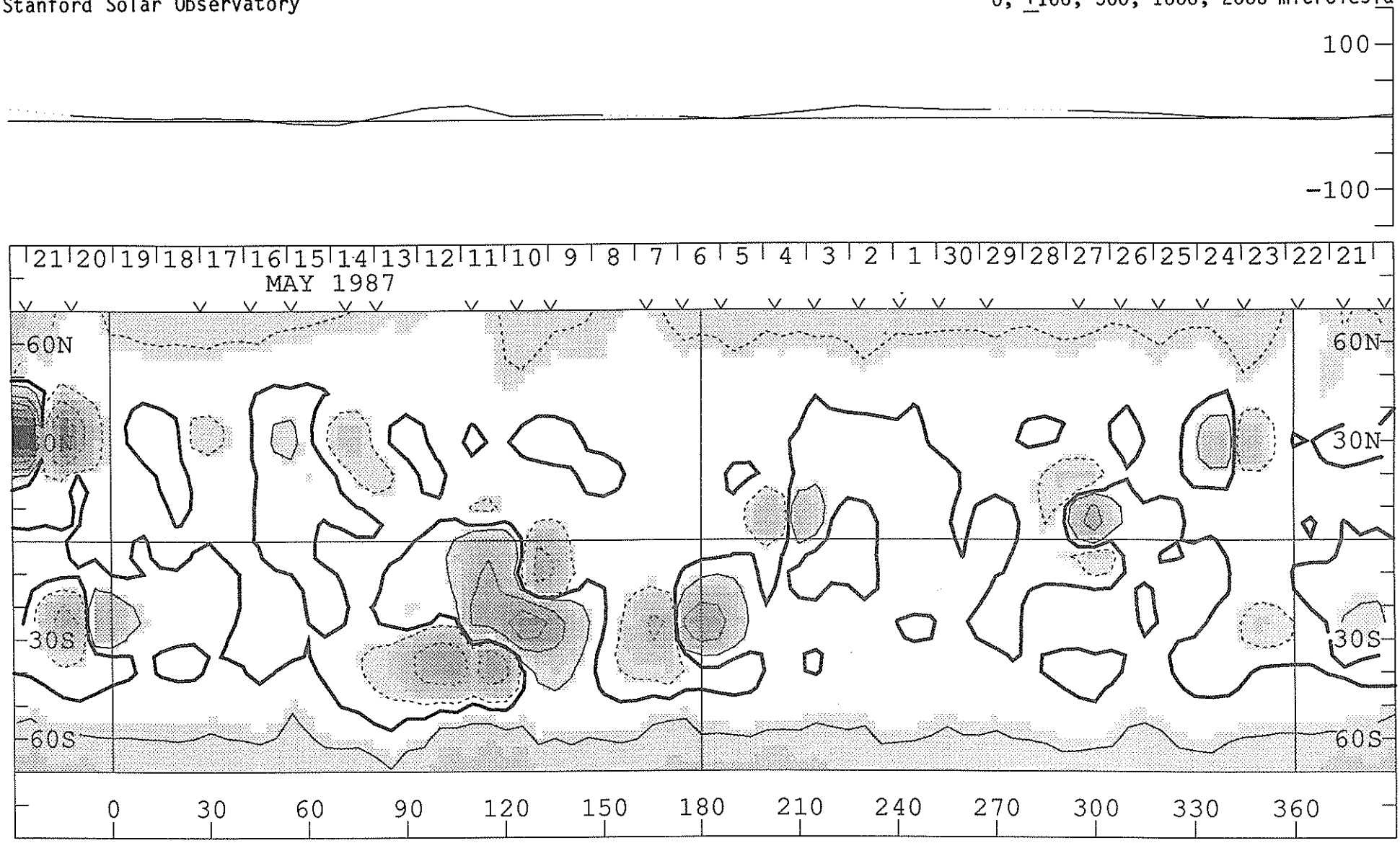
25
May 87

SOLAR MAGNETIC FIELD SYNOPTIC CHART

CARRINGTON ROTATION NUMBER 1788
(23 April to 20 May 1987)

Stanford Solar Observatory

0, ±100, 500, 1000, 2000 microTesla



Heliographic Longitude

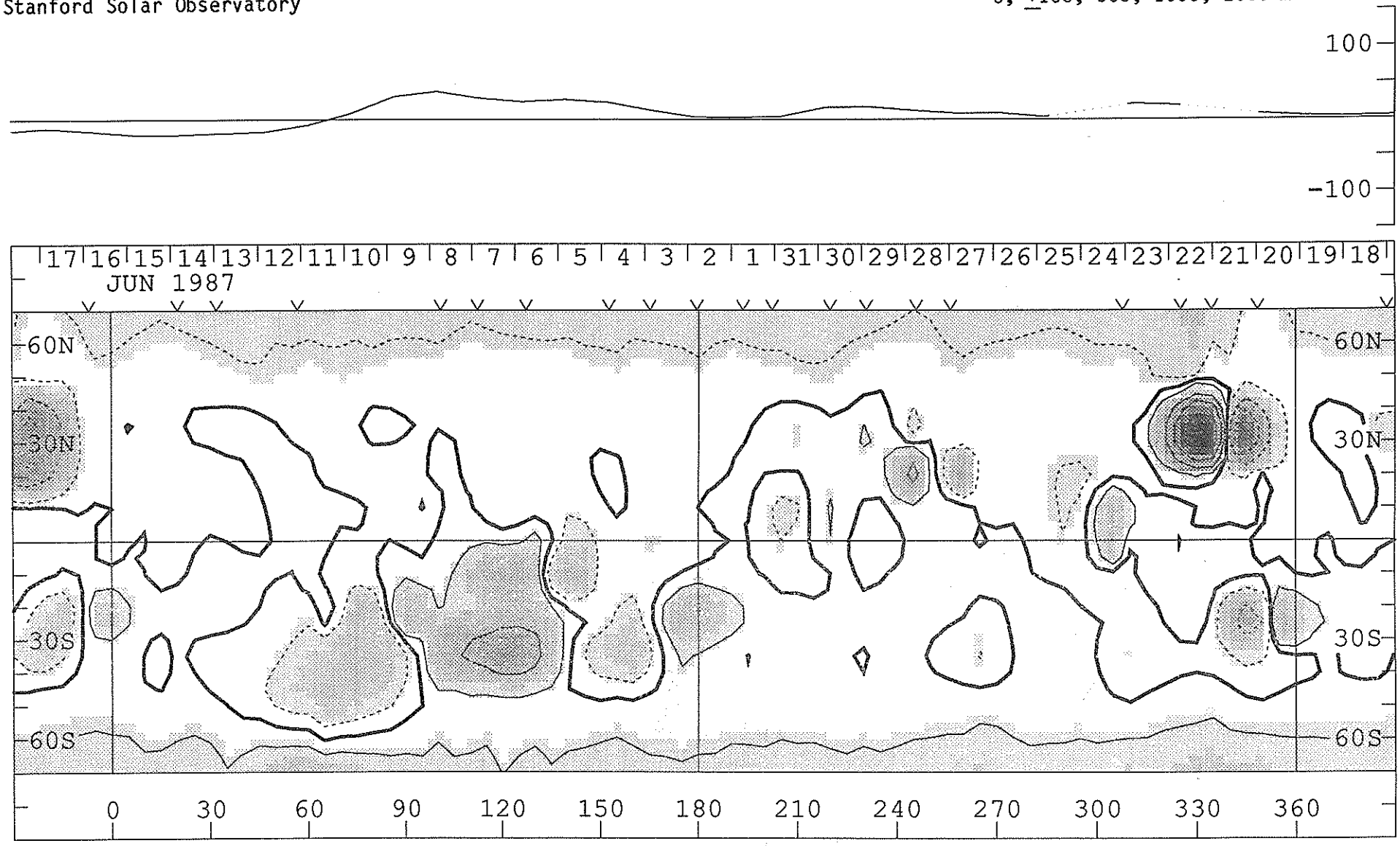
SOLAR MAGNETIC FIELD SYNOPTIC CHART

CARRINGTON ROTATION NUMBER 1789

(20 May to 16 June 1987)

Stanford Solar Observatory

0, ±100, 500, 1000, 2000 microTesla

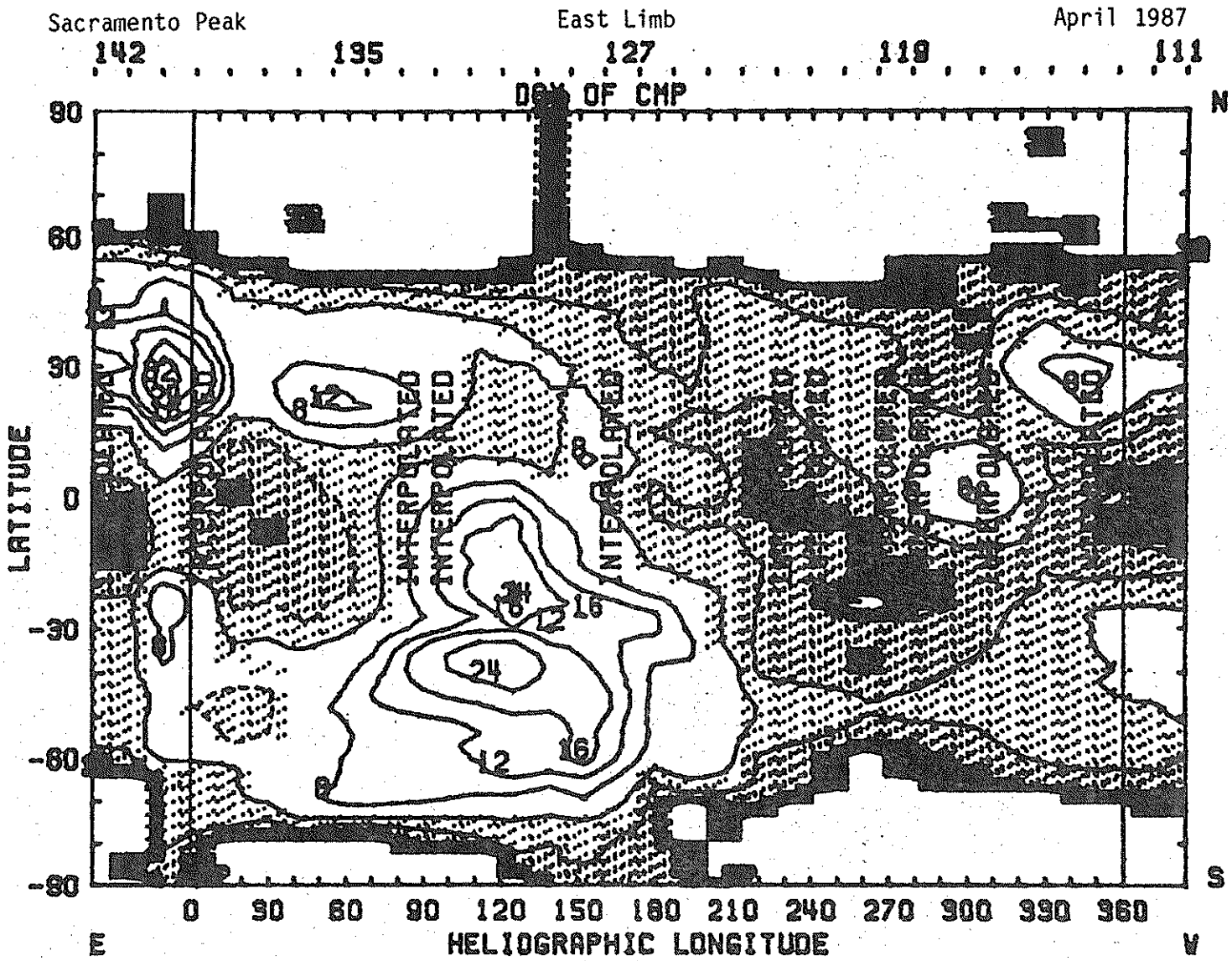


Heliographic Longitude

27 May 87

CORONAL GREEN LINE SYNOPTIC MAP

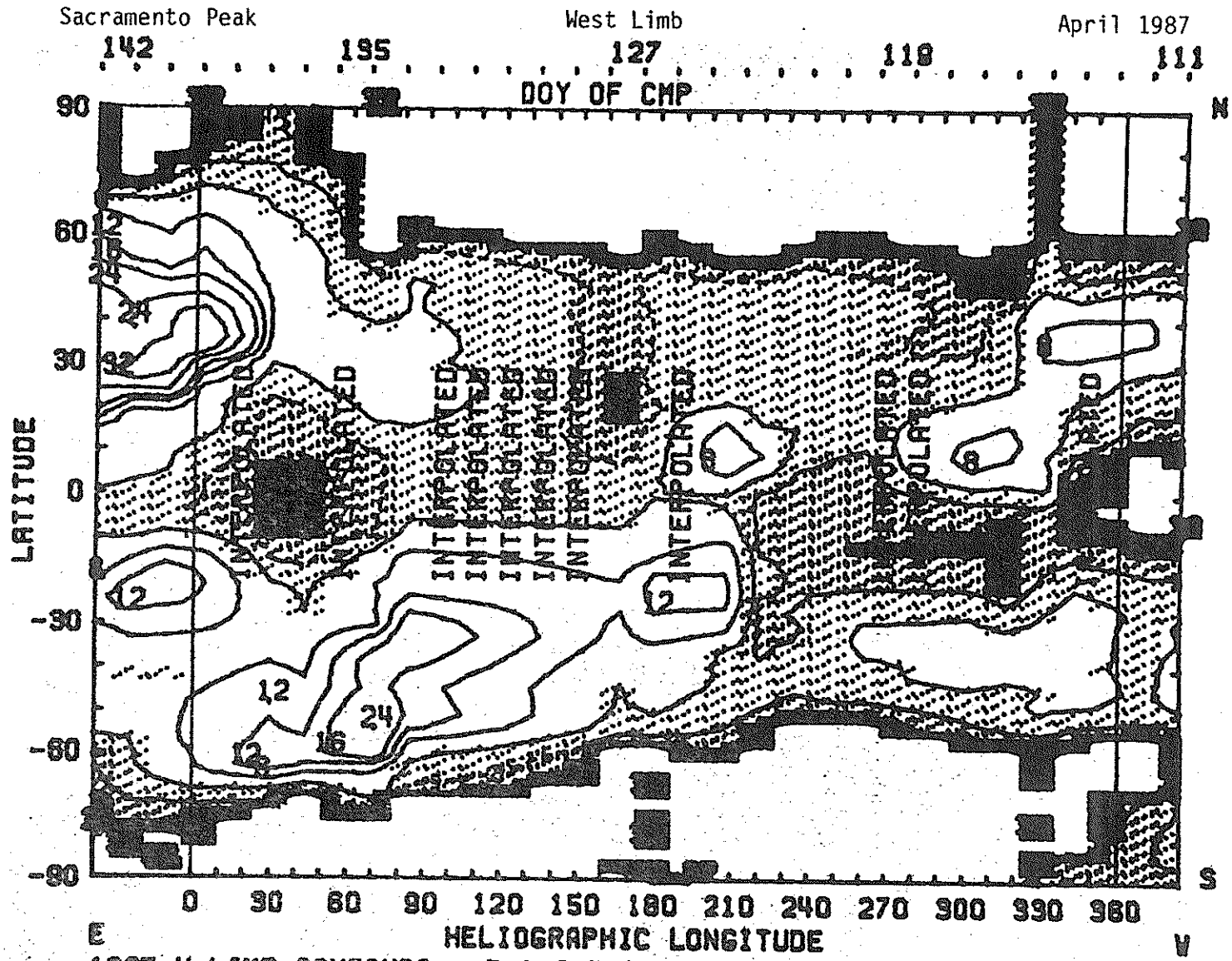
CARRINGTON ROTATION NUMBER 1788
(23 April to 20 May 1987)



1987 E LIMB CONTOURS: .5,1,2,4,8,12,16,24,32 MILLIONTHS OF Io
CORONAL HOLES ARE SHOWN AS WHITE SURROUNDED BY BLACK

CORONAL GREEN LINE SYNOPTIC MAP

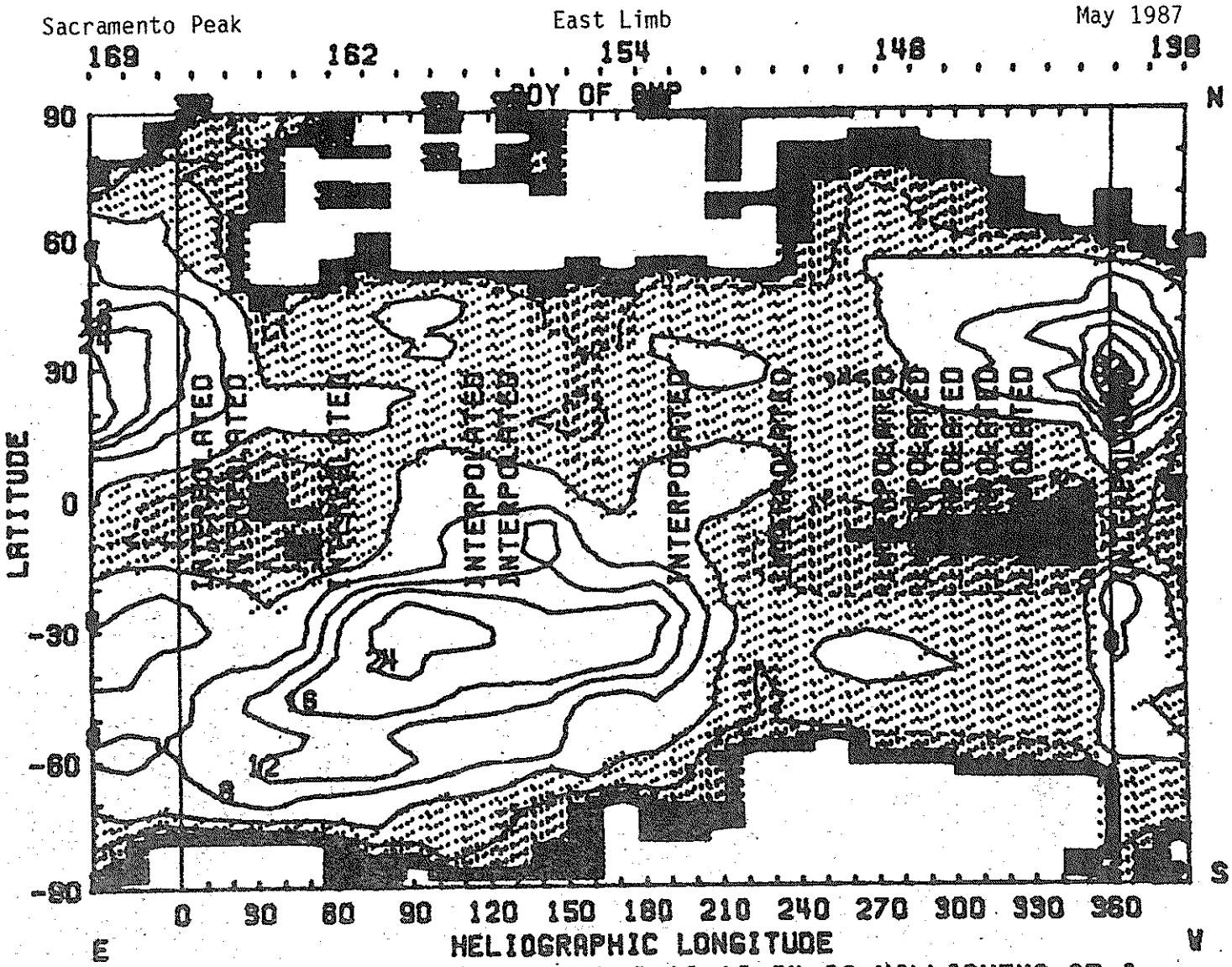
CARRINGTON ROTATION NUMBER 1788
(23 April to 20 May 1987)



1987 V LIMB CONTOURS: .5,1,2,4,8,12,16,24,92 MILLIONTHS OF Io
CORONAL HOLES ARE SHOWN AS WHITE SURROUNDED BY BLACK

CORONAL GREEN LINE SYNOPTIC MAP

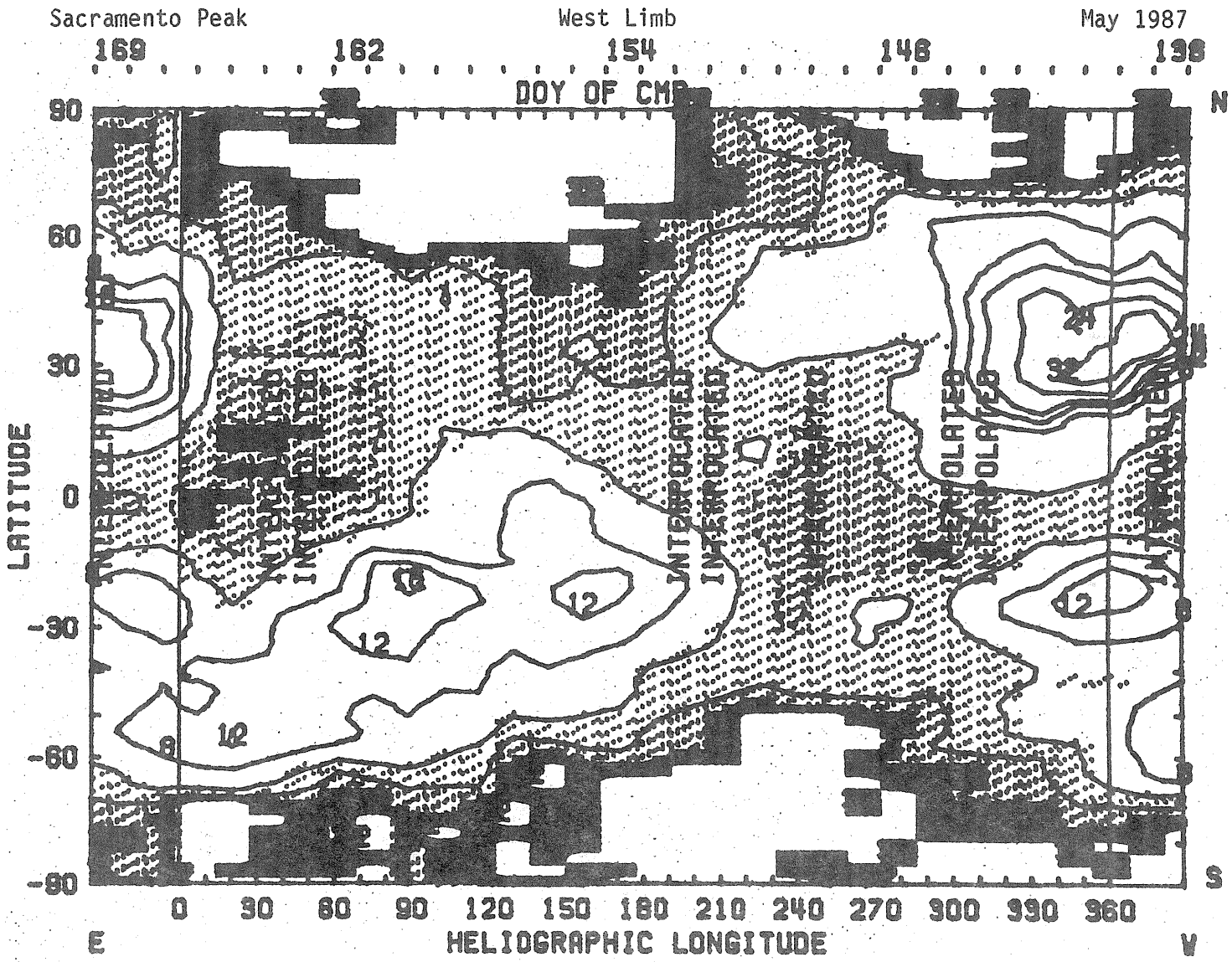
CARRINGTON ROTATION NUMBER 1789
(20 May to 16 June 1987)



1987 E LIMB CONTOURS: .5,1,2,4,8,12,16,24,32 MILLIONTHS OF Io
CORONAL HOLES ARE SHOWN AS WHITE SURROUNDED BY BLACK

CORONAL GREEN LINE SYNOPTIC MAP

CARRINGTON ROTATION NUMBER 1789
(20 May to 16 June 1987)



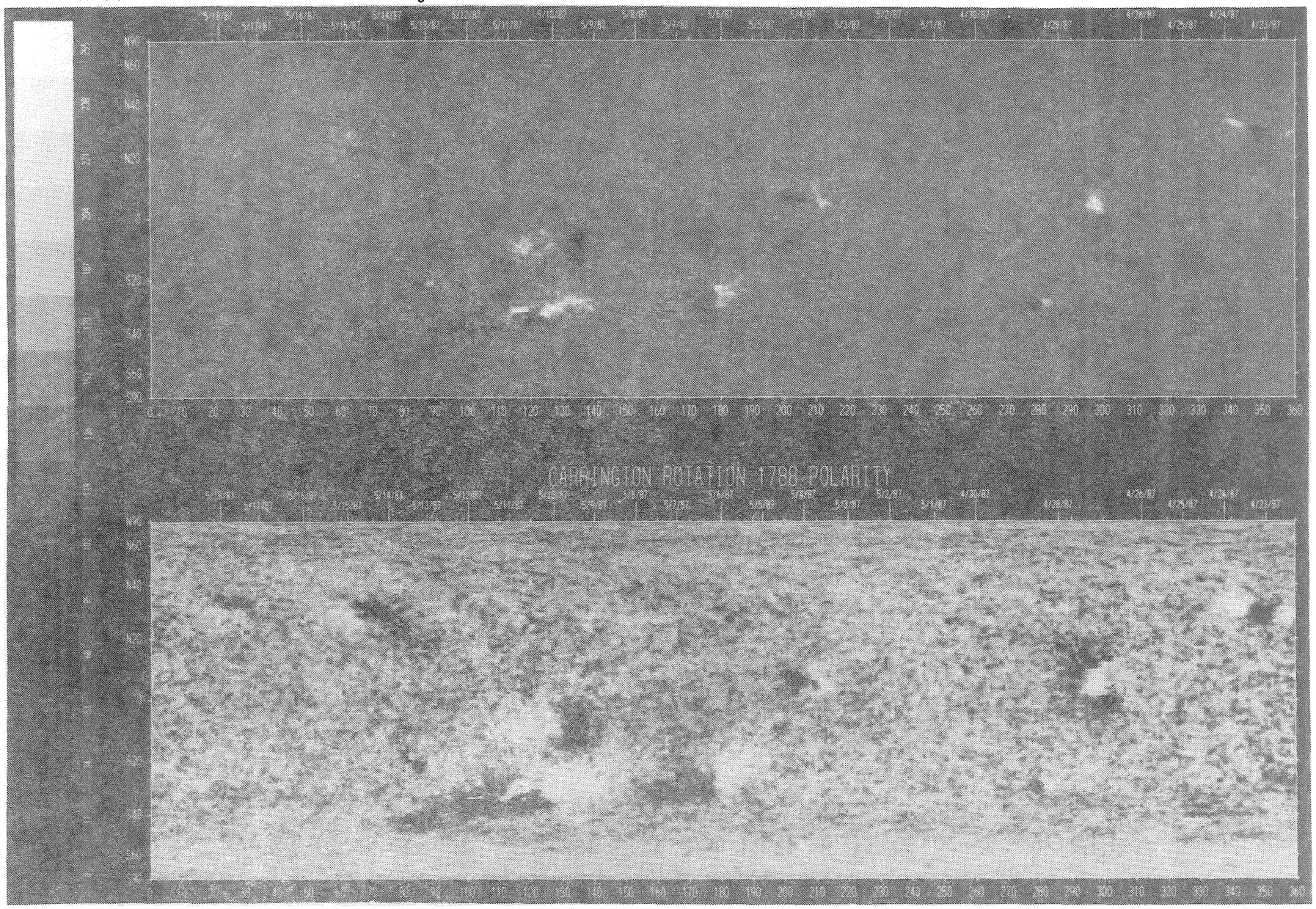
1987 W LIMB CONTOURS: .5,1,2,4,8,12,16,24,32 MILLIONTHS OF Io
CORONAL HOLES ARE SHOWN AS WHITE SURROUNDED BY BLACK

SOLAR MAGNETIC FIELD SYNOPTIC CHART

CARRINGTON ROTATION NUMBER 1788
(23 April to 20 May 1987)

Kitt Peak National Observatory

Dates of Observations

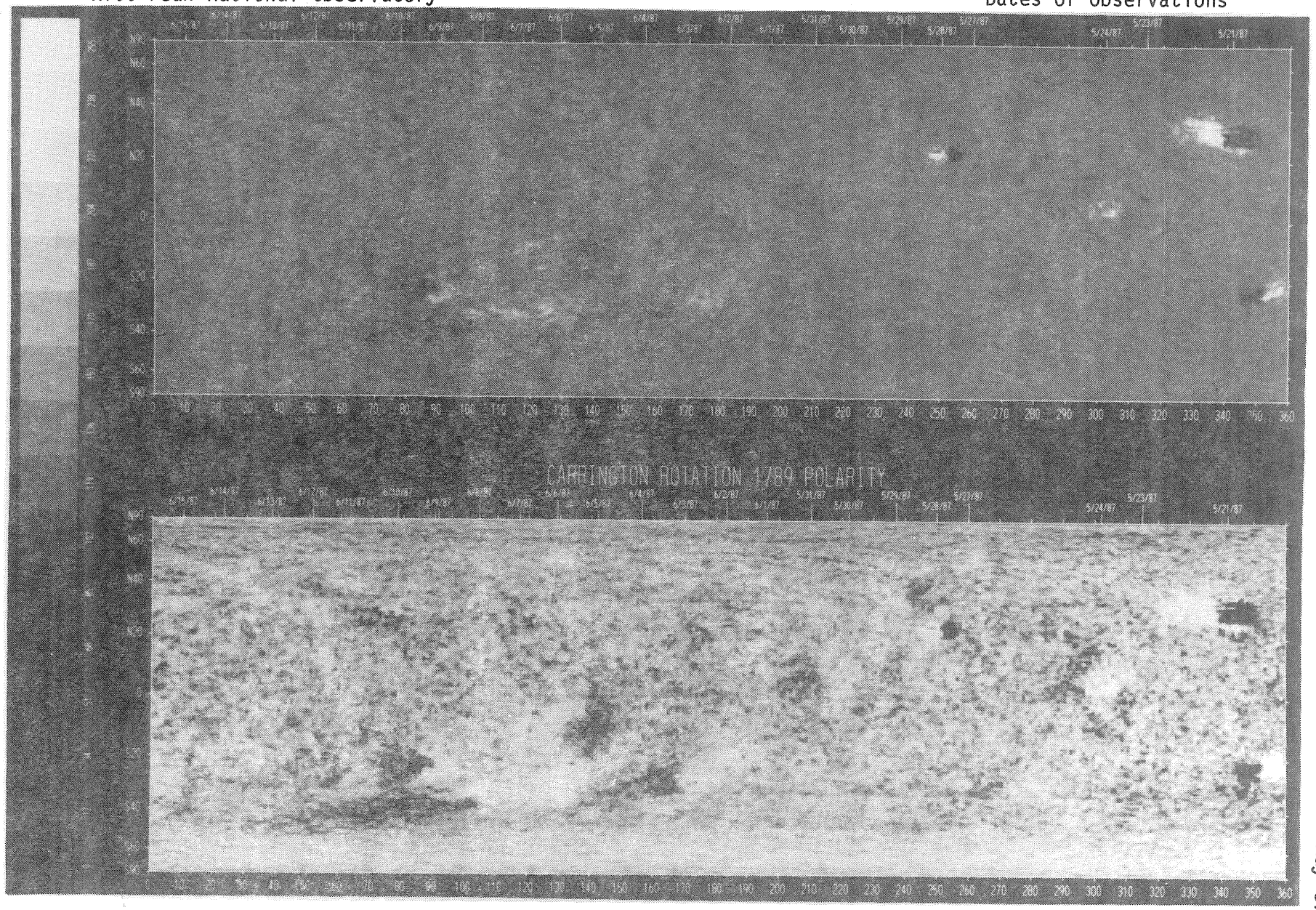


SOLAR MAGNETIC FIELD SYNOPTIC CHART

CARRINGTON ROTATION NUMBER 1789
(20 May to 16 June 1987)

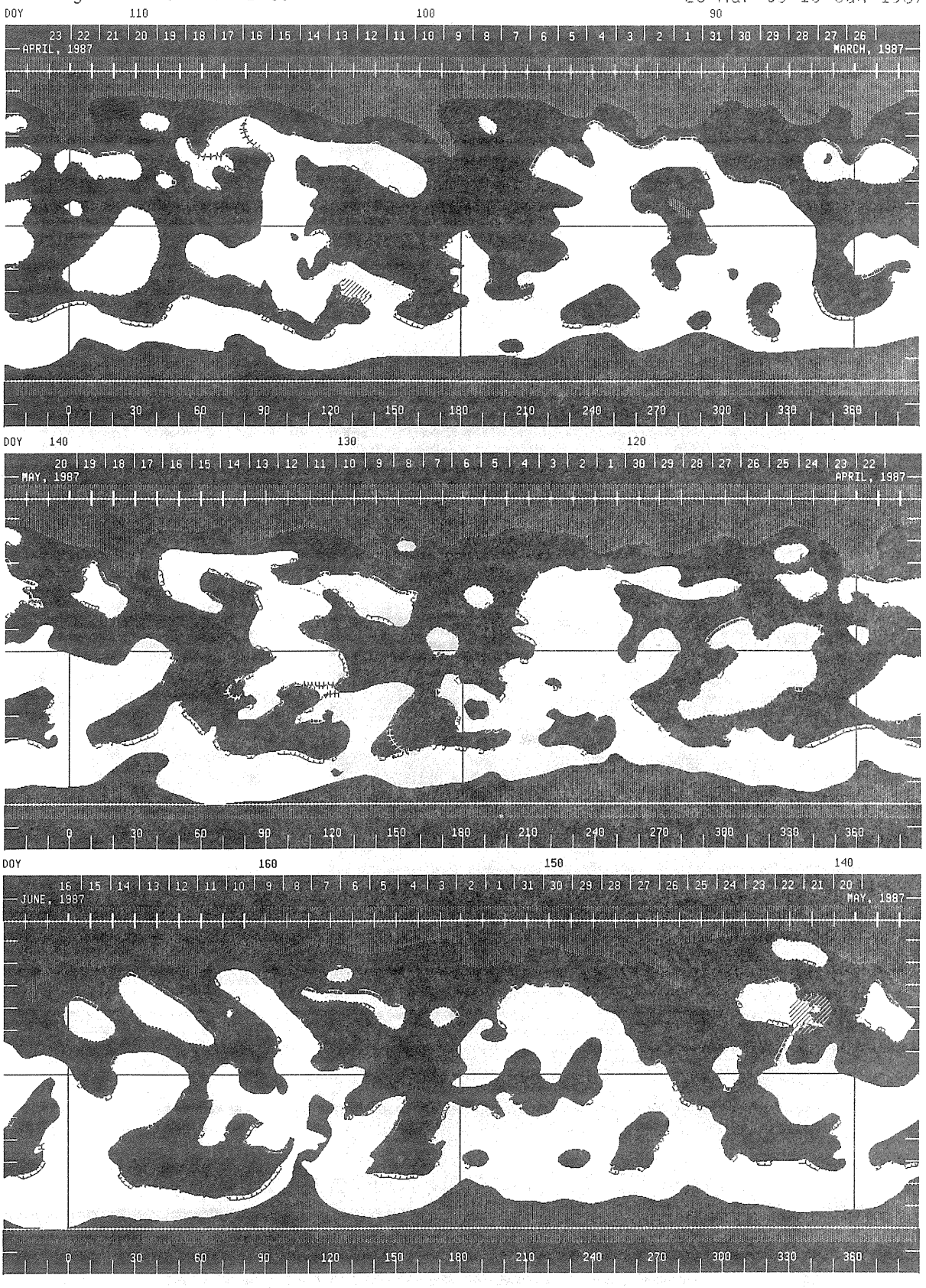
Kitt Peak National Observatory

Dates of Observations



SHADED H-ALPHA SOLAR SYNOPTIC CHARTS

Carrington Rot. 1787-1789 26 Mar to 16 Jun 1987



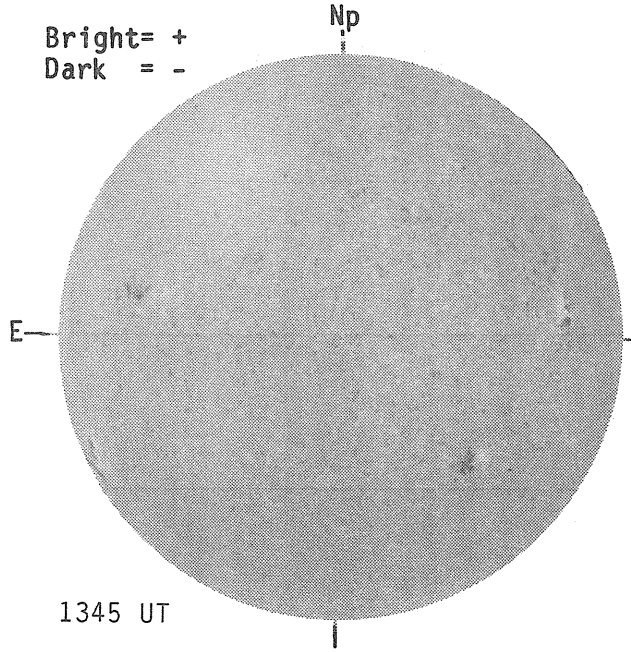
□ = *Positive Polarity* ■ = *Negative Polarity* ■ = *10830 Coronal Hole Estimate*

Heliographic Longitude

M A Y 01, 1 9 8 7 (P=-24.15, B_0=-4.17, L_0= 254.36)

KITT PEAK MAGNETOGRAM

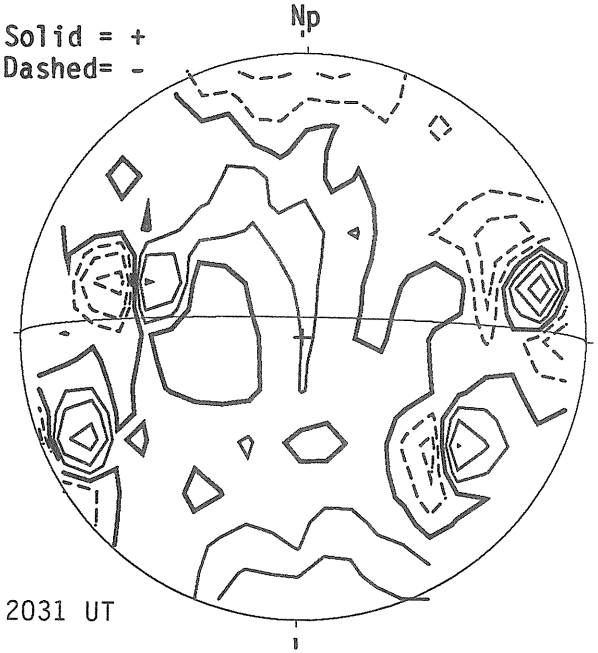
Bright= +
Dark = -



1345 UT

STANFORD MAGNETOGRAM

Solid = +
Dashed= -

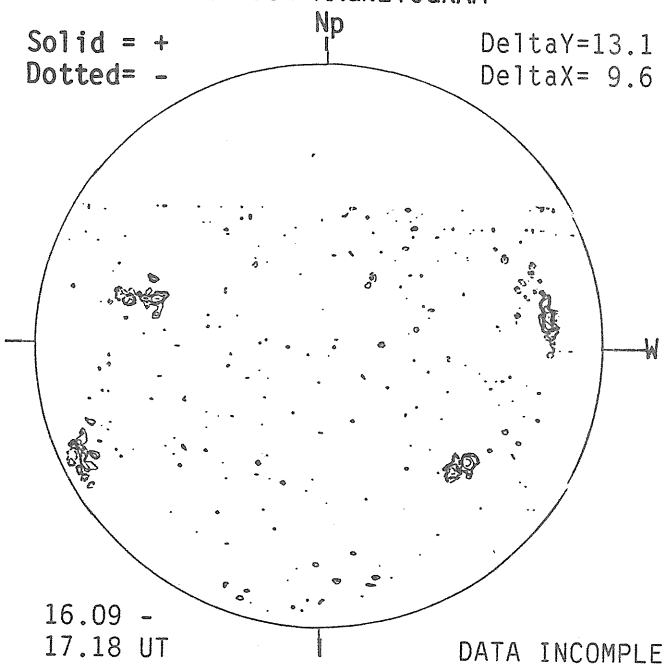


2031 UT

MT. WILSON MAGNETOGRAM

Solid = +
Dotted= -

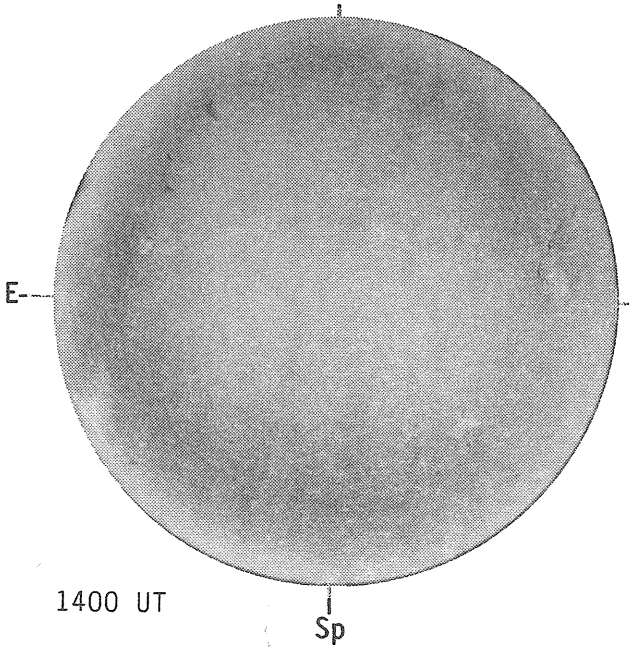
DeltaY=13.1
DeltaX= 9.6



16.09 -
17.18 UT

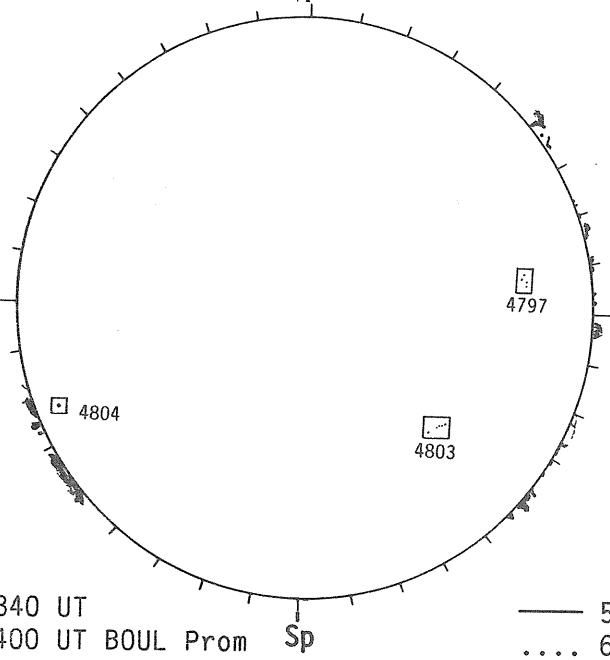
DATA INCOMPLETE

BOULDER H-ALPHA



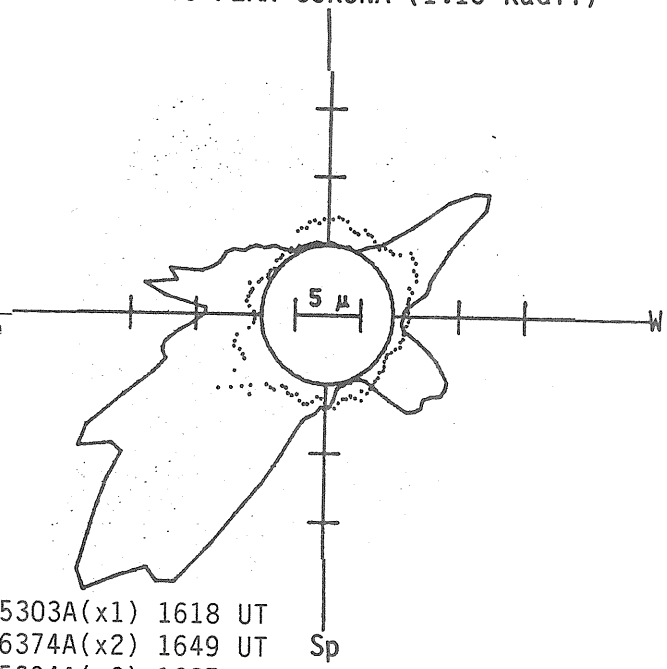
1400 UT

BOULDER SUNSPOTS



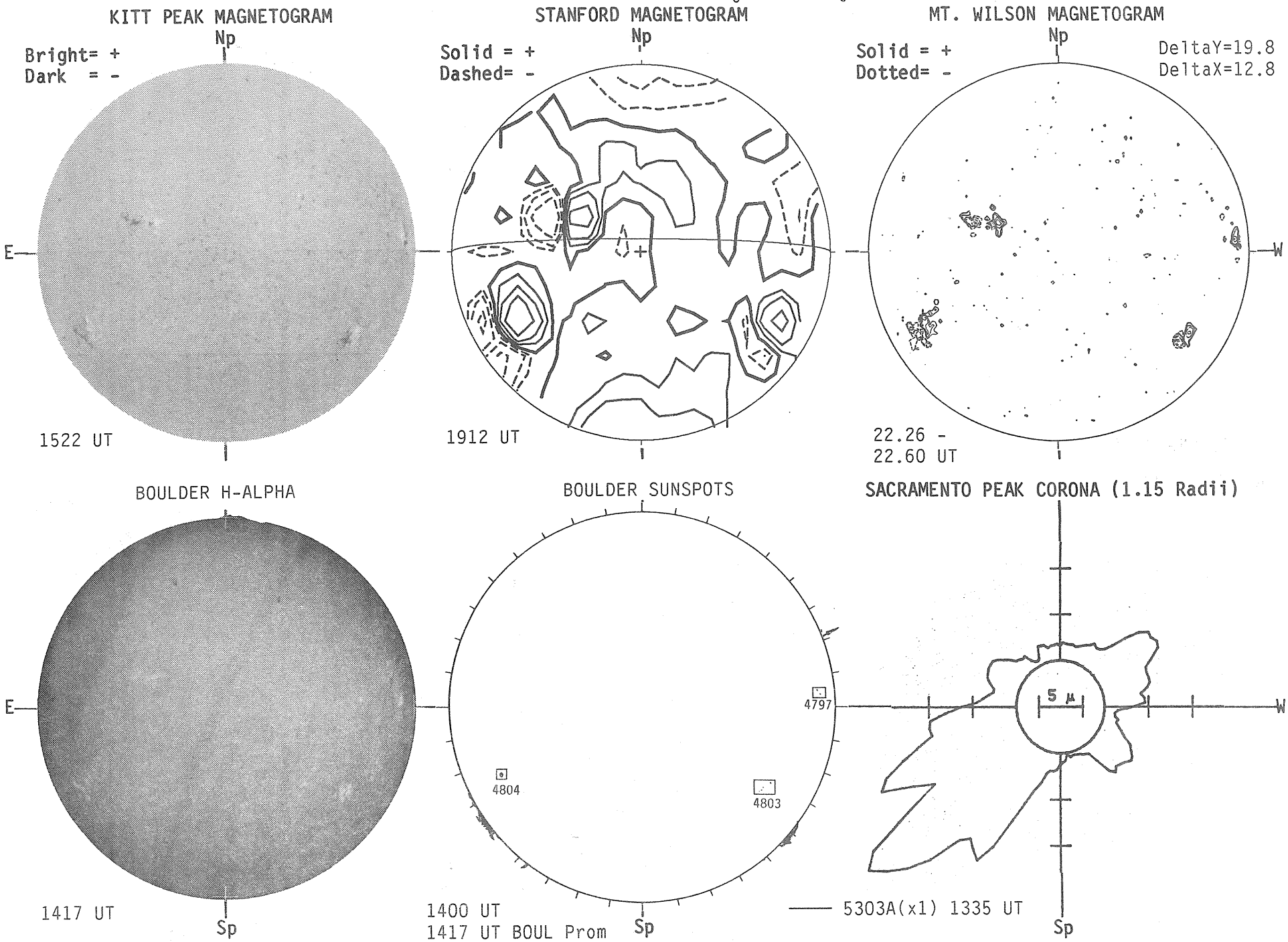
1340 UT
1400 UT BOUL Prom

SACRAMENTO PEAK CORONA (1.15 Radii)



—— 5303A(x1) 1618 UT
.... 6374A(x2) 1649 UT
xxxx 5694A(x6) 1627 UT
NO 5694A ACTIVITY TODAY

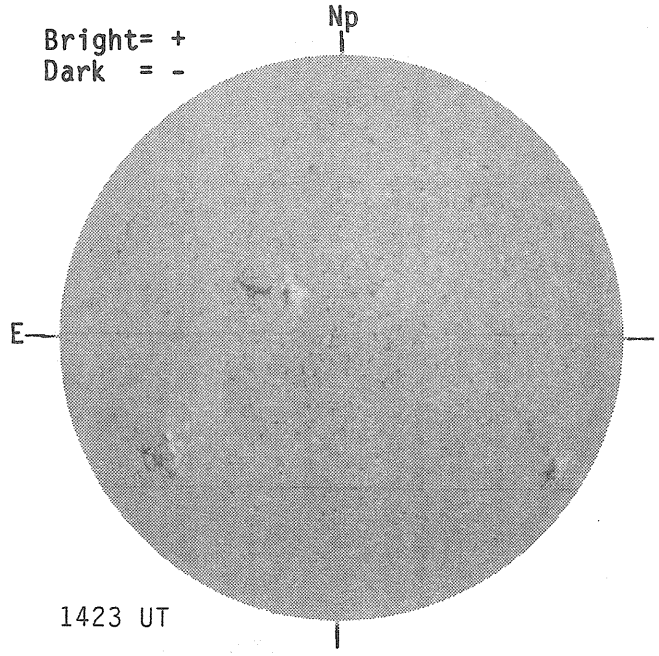
M A Y 02, 1 9 8 7 (P=-23.98, B_0=-4.08, L_0= 241.15)



M A Y 03, 1 9 8 7 (P=-23.79, B_0=-3.98, L_0= 227.93)

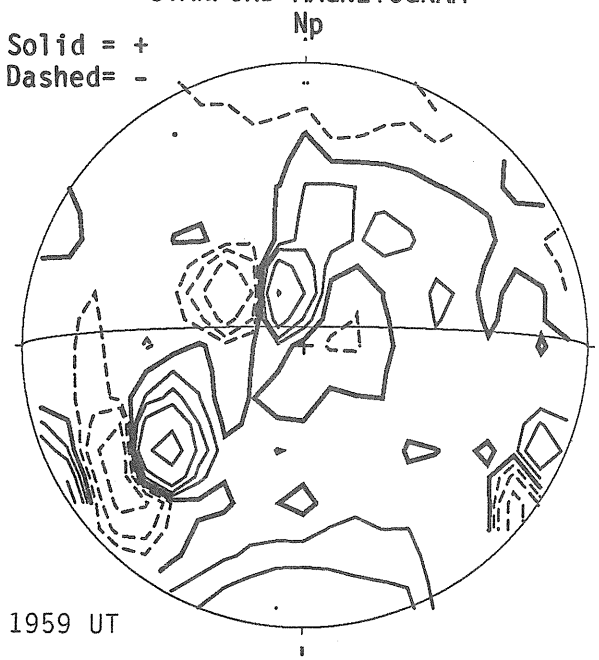
KITT PEAK MAGNETOGRAM

Bright= +
Dark = -



STANFORD MAGNETOGRAM

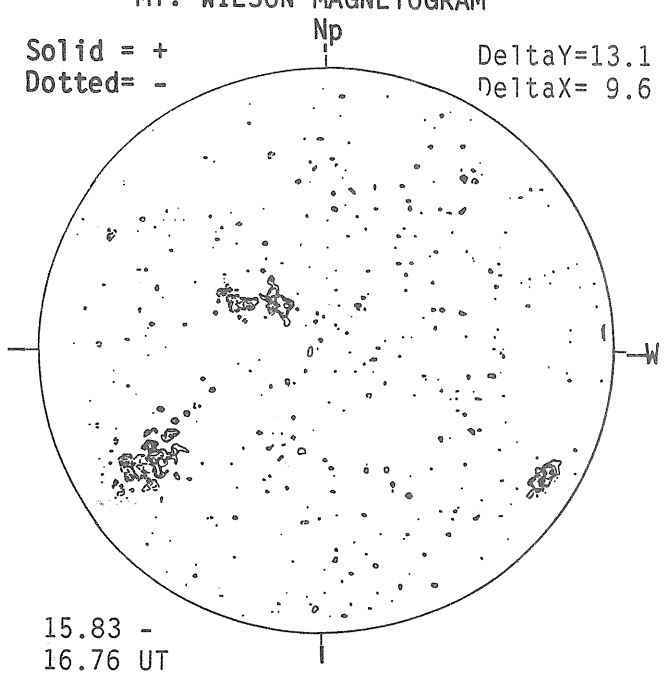
Solid = +
Dashed= -



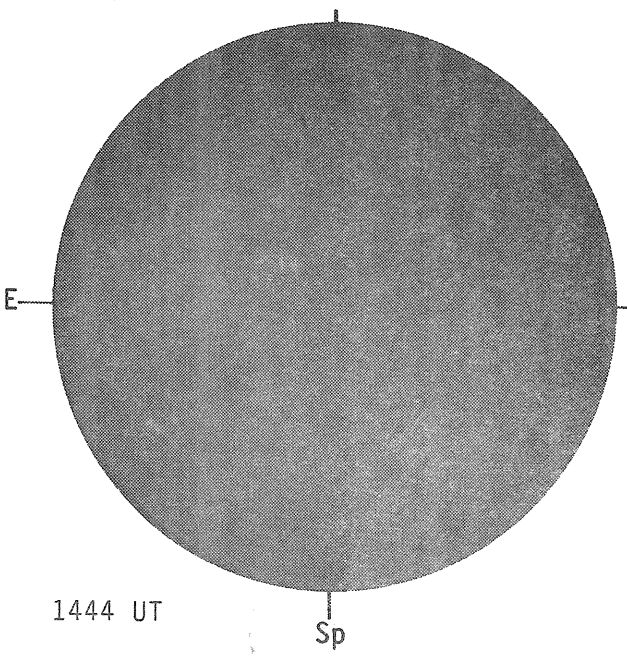
MT. WILSON MAGNETOGRAM

Solid = +
Dotted= -

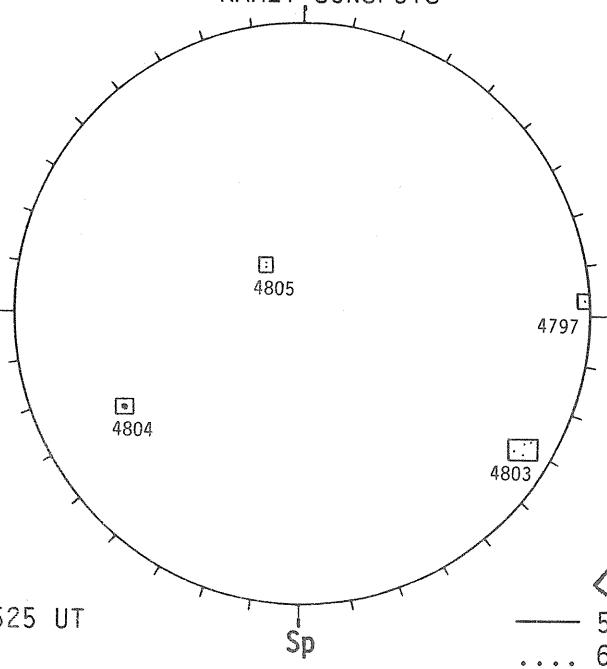
DeltaY=13.1
DeltaX= 9.6



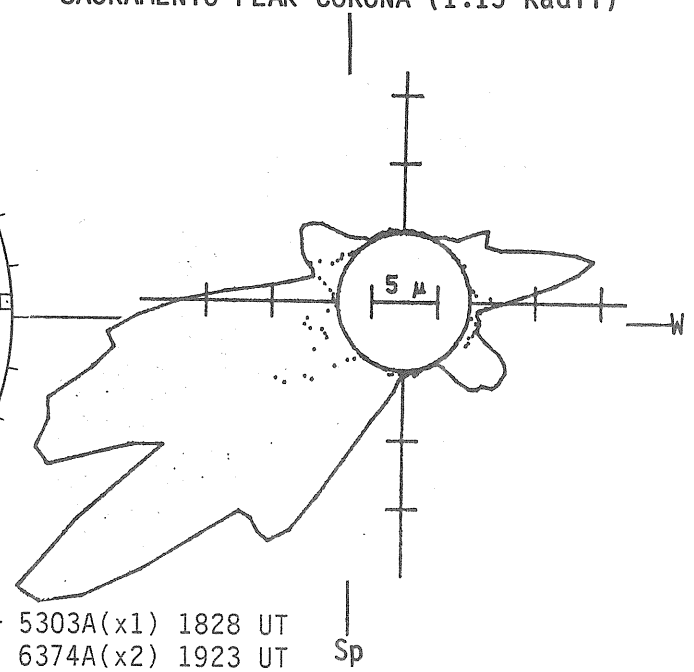
SACRAMENTO PEAK H-ALPHA



RAMEY SUNSPOTS



SACRAMENTO PEAK CORONA (1.15 Radii)

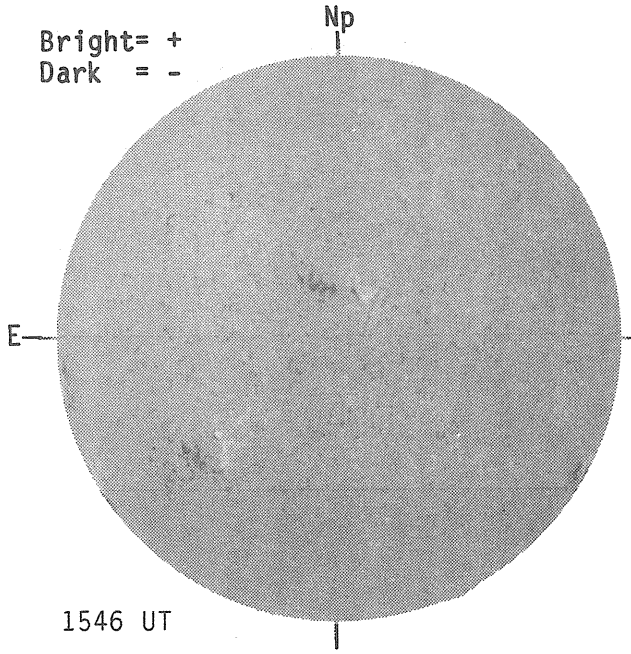


—— 5303A(x1) 1828 UT
.... 6374A(x2) 1923 UT
xxxx 5694A(x6) 1911 UT
NO 5694A ACTIVITY TODAY

M A Y 04, 1 9 8 7 (P=-23.60, B_0=-3.87, L_0= 214.71)

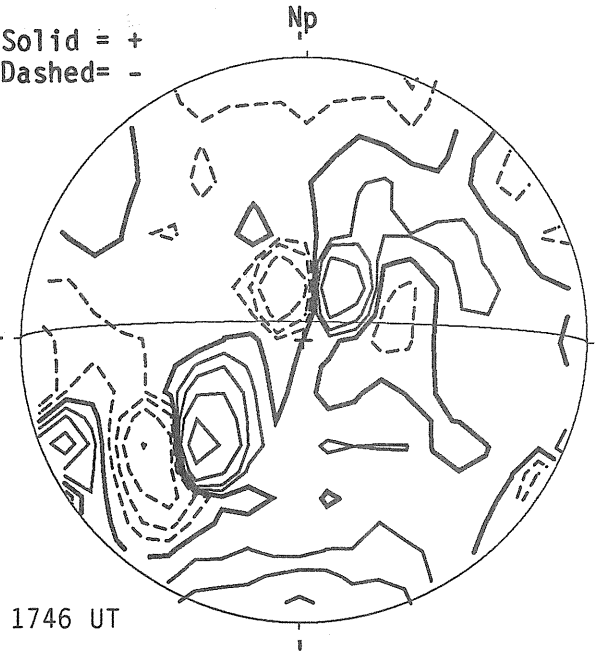
KITT PEAK MAGNETOGRAM

Bright= +
Dark = -



STANFORD MAGNETOGRAM

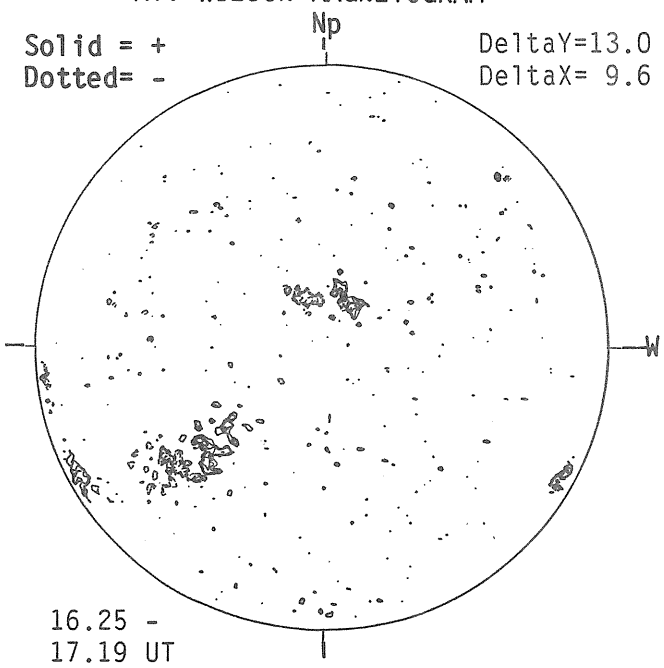
Solid = +
Dashed= -



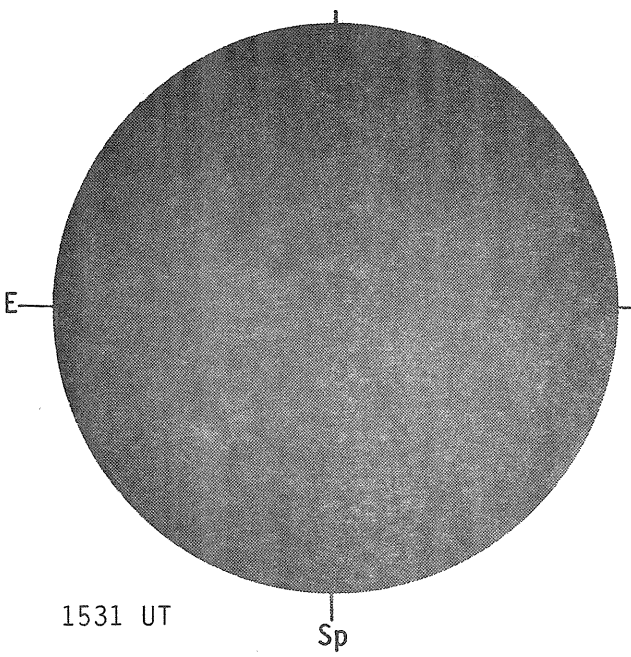
MT. WILSON MAGNETOGRAM

Solid = +
Dotted= -

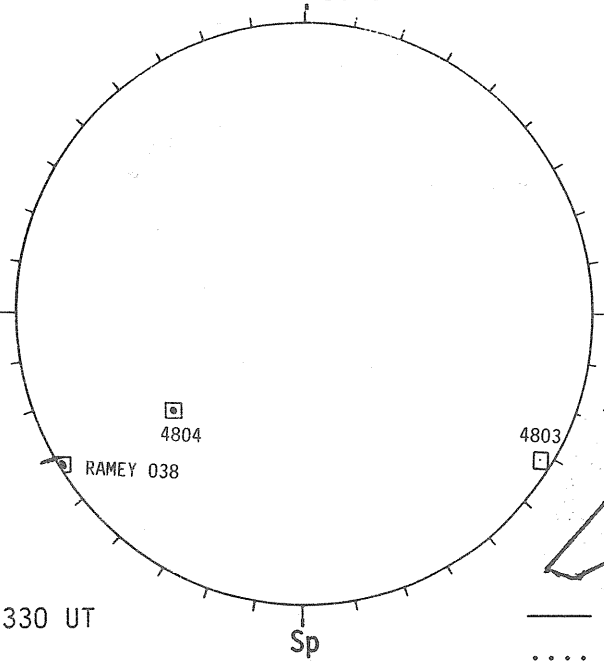
DeltaY=13.0
DeltaX= 9.6



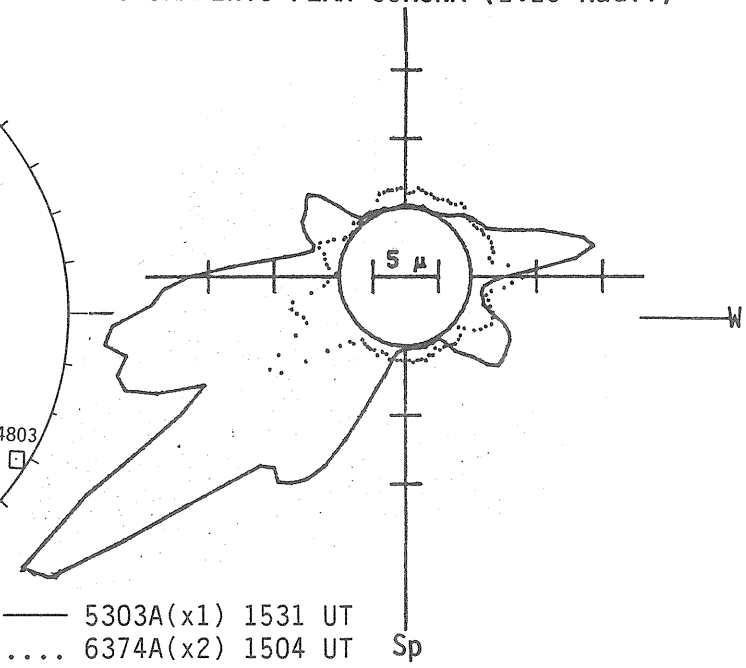
SACRAMENTO PEAK H-ALPHA



RAMEY SUNSPOTS



SACRAMENTO PEAK CORONA (1.15 Radii)

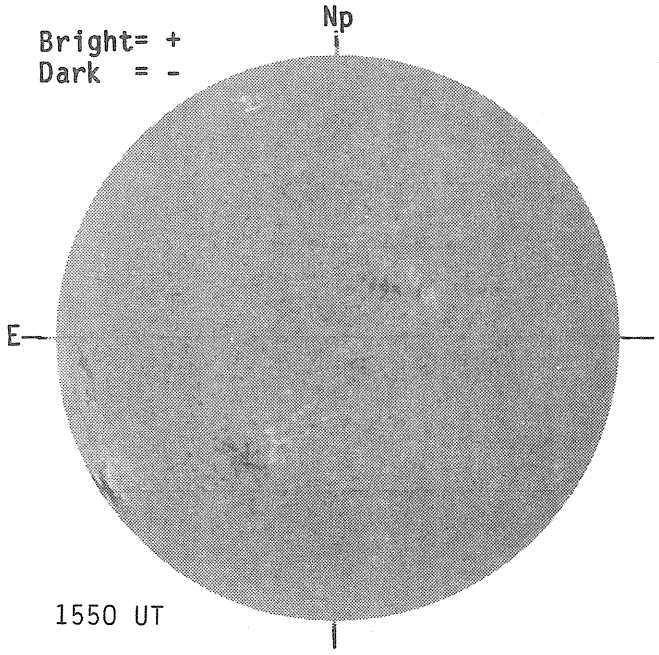


—— 5303A(x1) 1531 UT
.... 6374A(x2) 1504 UT
xxxx 5694A(x6) 1451 UT
NO 5694A ACTIVITY TODAY

M A Y 05, 1 9 8 7 (P=-23.40, B_0=-3.77, L_0= 201.50)

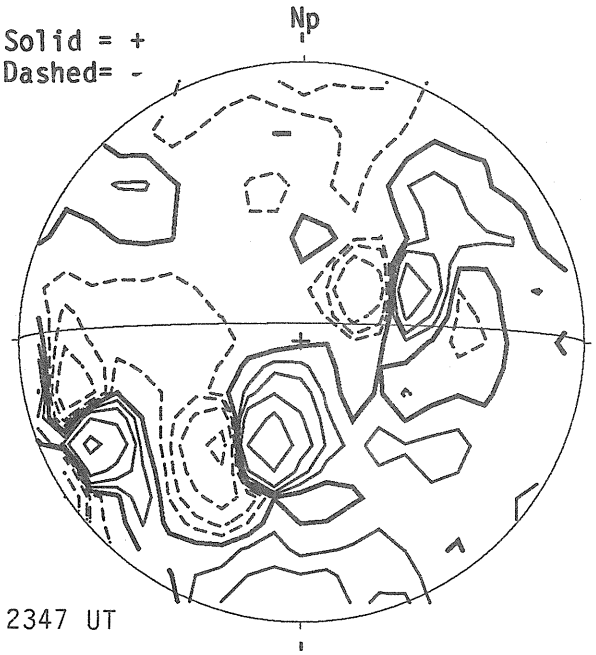
KITT PEAK MAGNETOGRAM

Bright= +
Dark = -



STANFORD MAGNETOGRAM

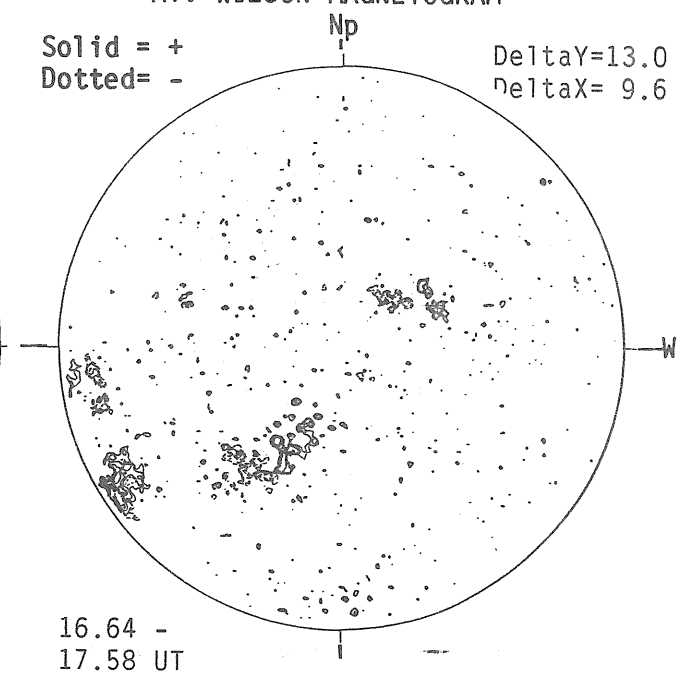
Solid = +
Dashed= -



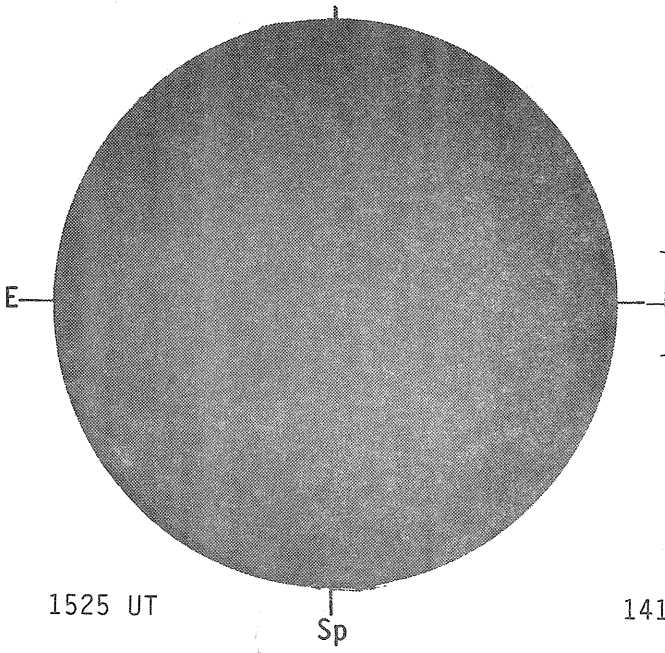
MT. WILSON MAGNETOGRAM

Solid = +
Dotted= -

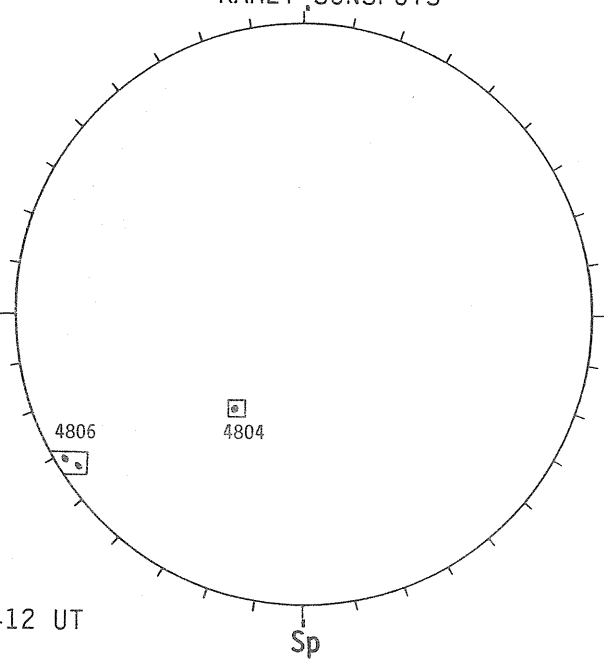
DeltaY=13.0
DeltaX= 9.6



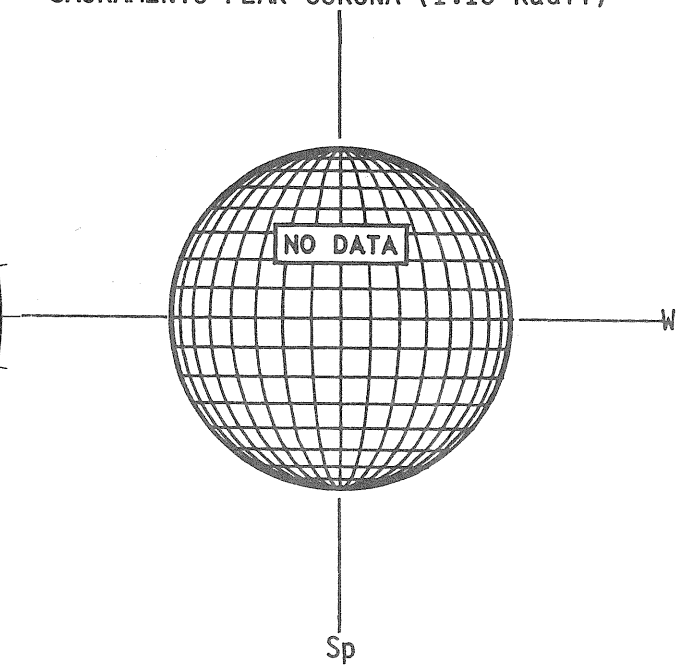
SACRAMENTO PEAK H-ALPHA



RAMEY SUNSPOTS



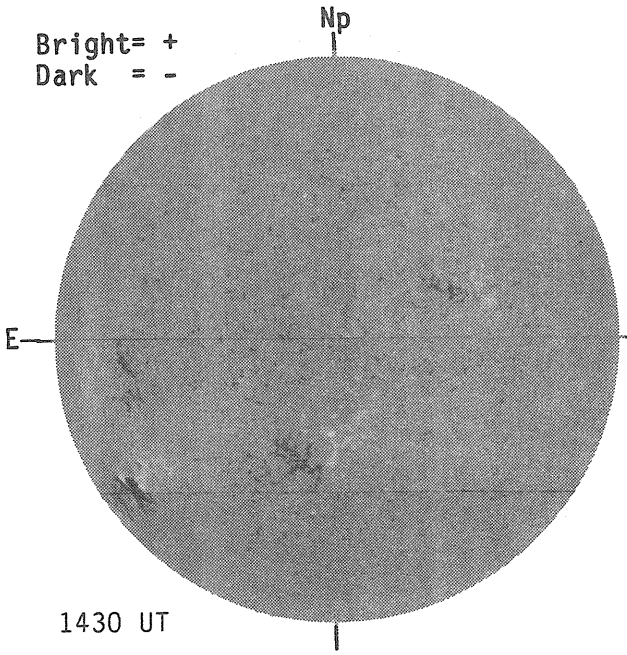
SACRAMENTO PEAK CORONA (1.15 Radii)



M A Y 06, 1 9 8 7 (P=-23.19, B_0=-3.67, L_0= 188.28)

KITT PEAK MAGNETOGRAM

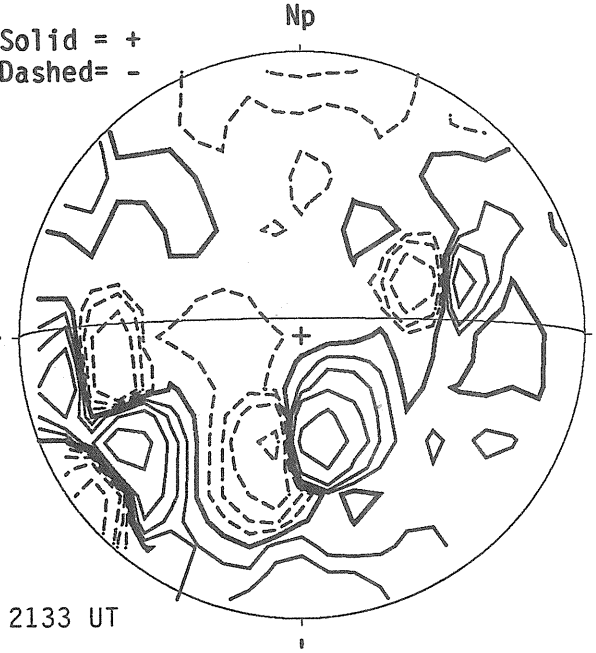
Bright= +
Dark = -



1430 UT

STANFORD MAGNETOGRAM

Solid = +
Dashed= -

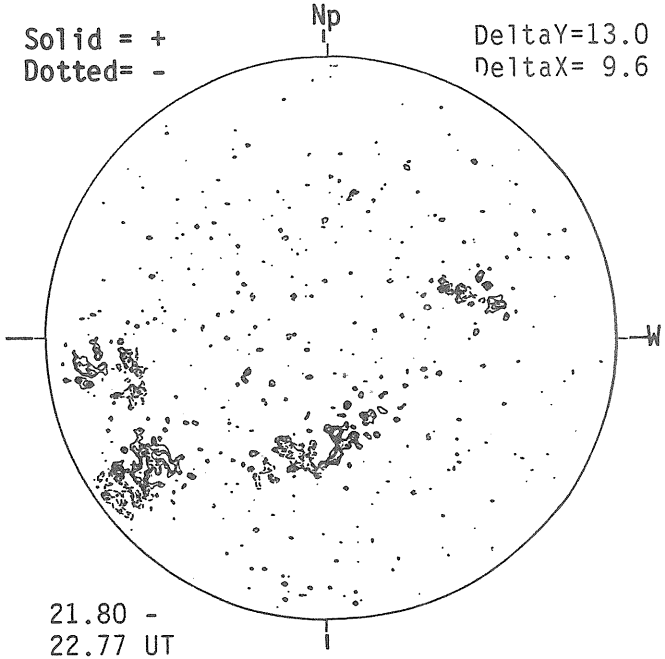


2133 UT

MT. WILSON MAGNETOGRAM

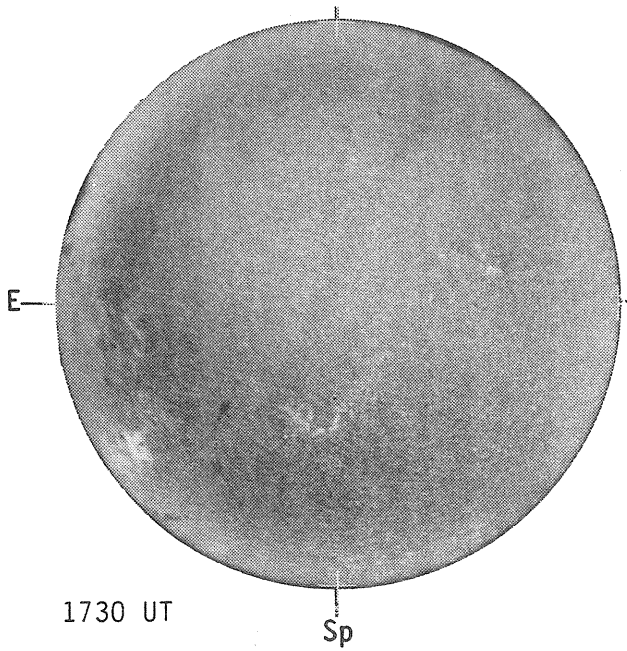
Solid = +
Dotted= -

DeltaY=13.0
DeltaX= 9.6



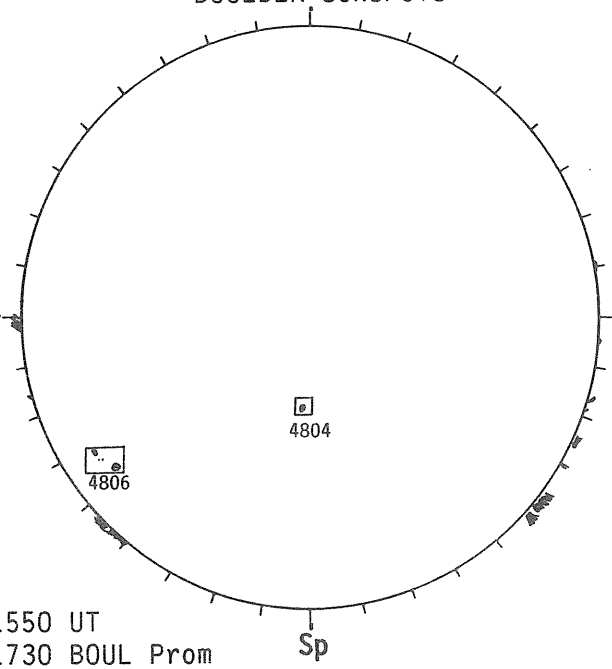
21.80 -
22.77 UT

BOULDER H-ALPHA



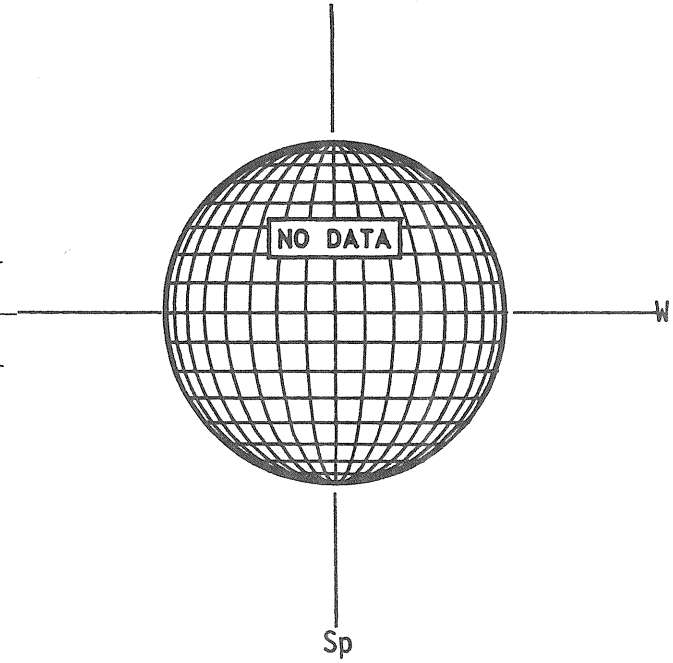
1730 UT

BOULDER SUNSPOTS



1550 UT
1730 BOUL Prom

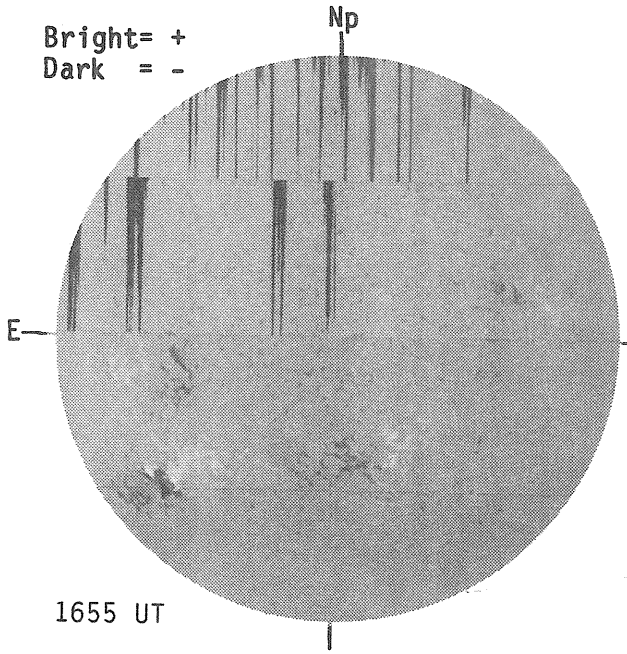
SACRAMENTO PEAK CORONA (1.15 Radii)



M A Y 07, 1 9 8 7 (P=-22.98, B_o=-3.57, L_o= 175.06)

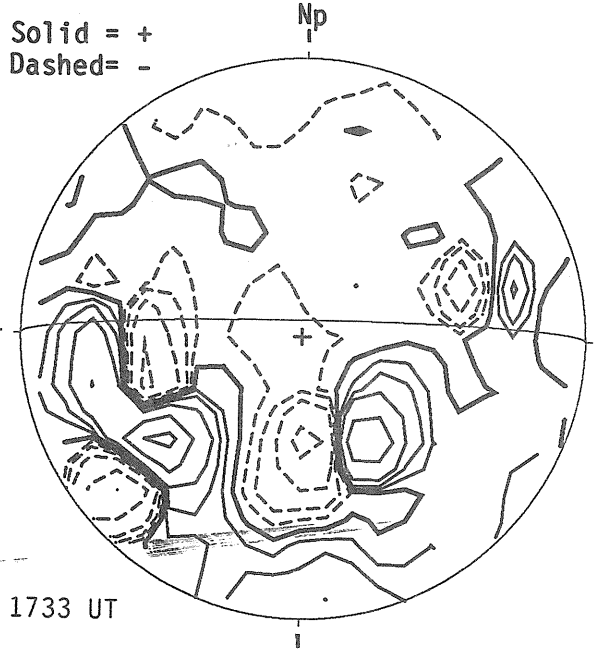
KITT PEAK MAGNETOGRAM

Bright= +
Dark = -



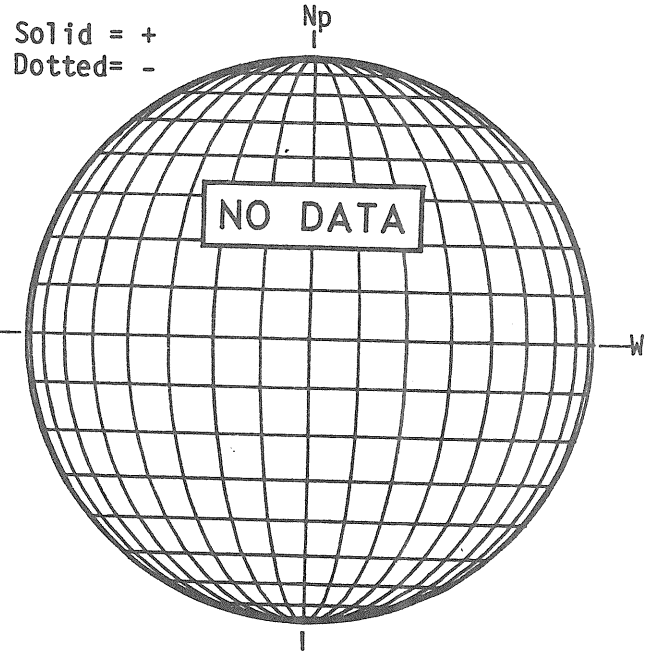
STANFORD MAGNETOGRAM

Solid = +
Dashed= -

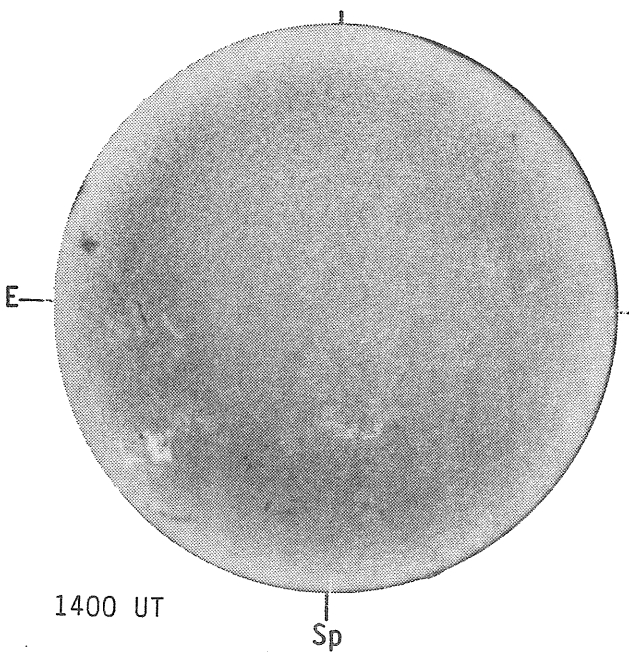


MT. WILSON MAGNETOGRAM

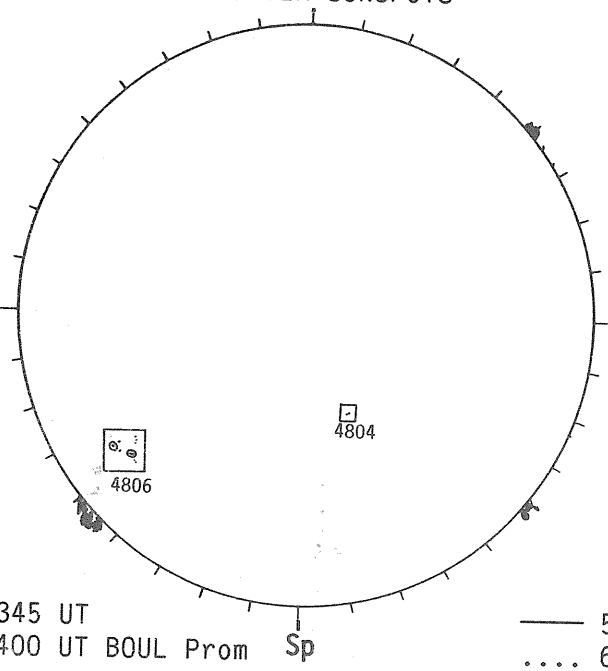
Solid = +
Dotted= -



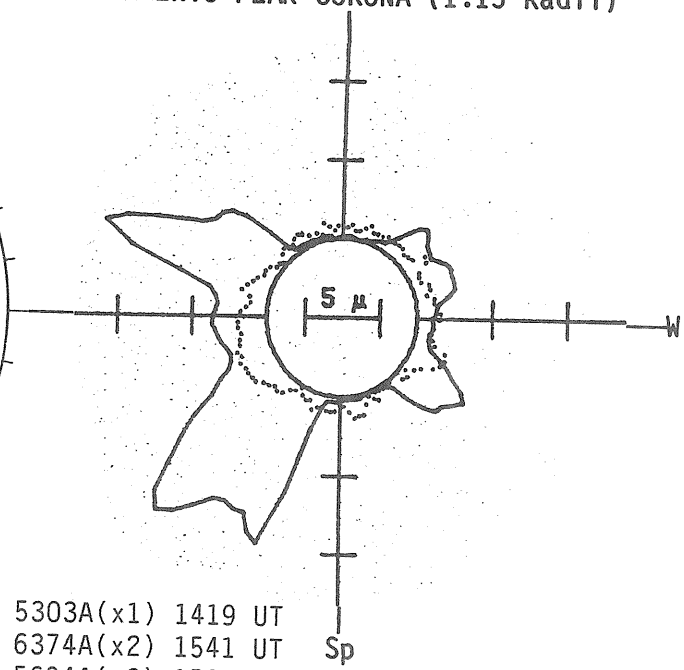
BOULDER H-ALPHA



BOULDER SUNSPOTS



SACRAMENTO PEAK CORONA (1.15 Radii)

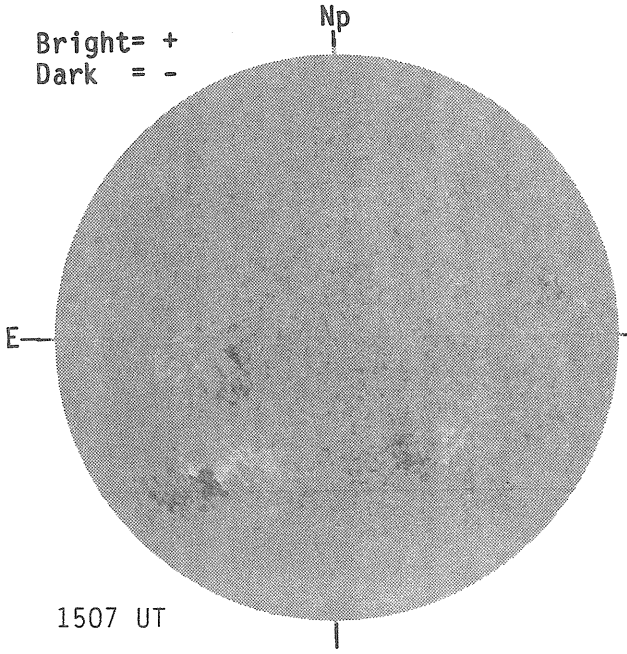


—— 5303A(x1) 1419 UT
.... 6374A(x2) 1541 UT
xxxx 5694A(x6) 1523 UT
NO 5694A ACTIVITY TODAY

M A Y 08, 1 9 8 7 (P=-22.76, B_0=-3.46, L_0= 161.84)

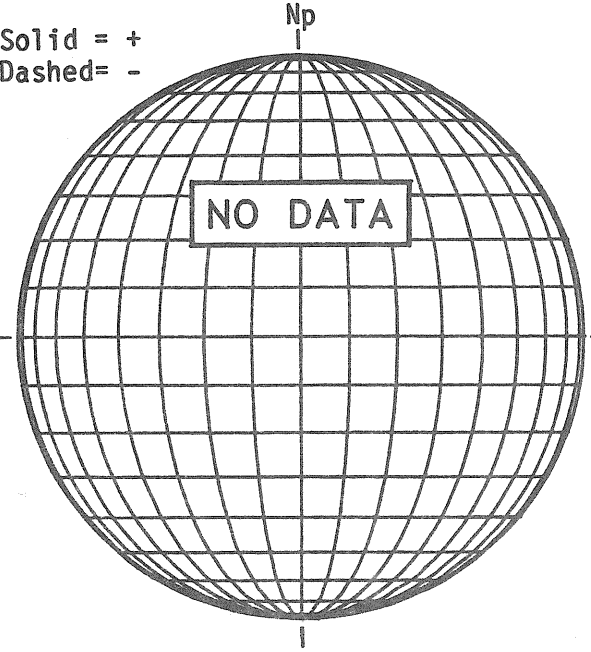
KITT PEAK MAGNETOGRAM

Bright= +
Dark = -



STANFORD MAGNETOGRAM

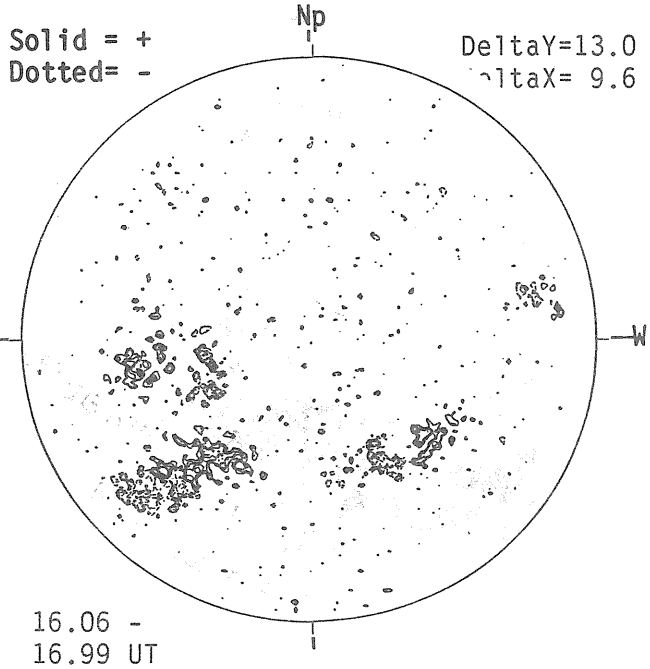
Solid = +
Dashed= -



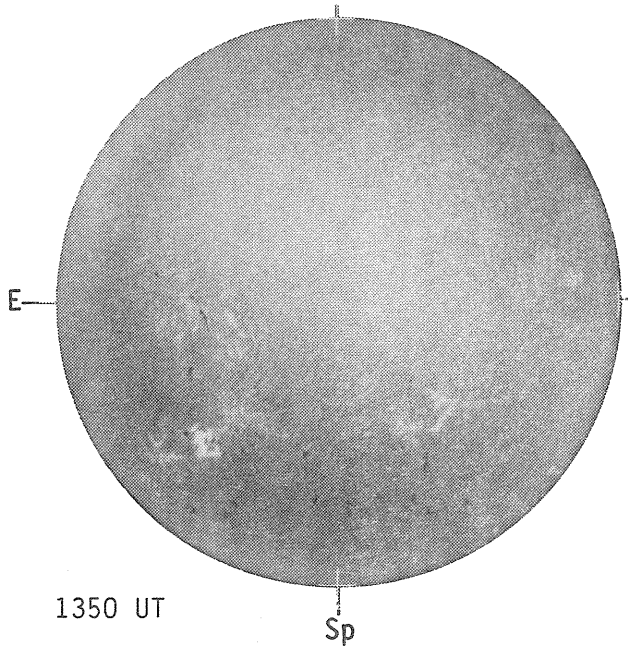
MT. WILSON MAGNETOGRAM

Solid = +
Dotted= -

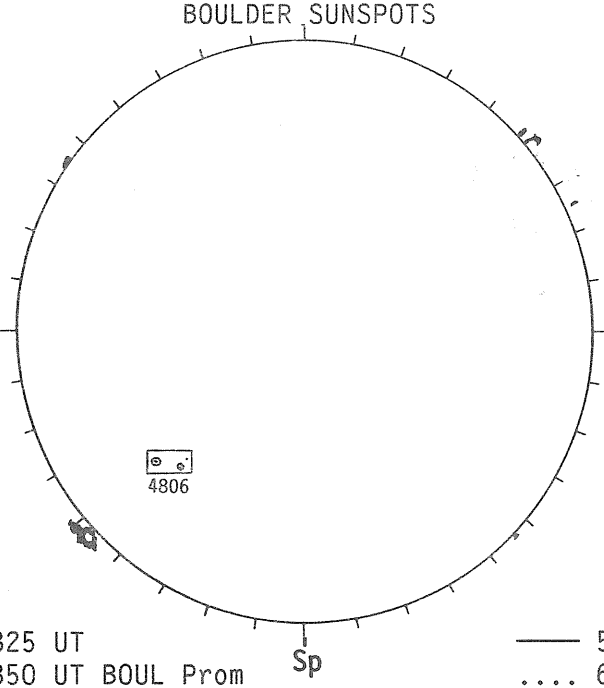
DeltaY=13.0
DeltaX= 9.6



BOULDER H-ALPHA

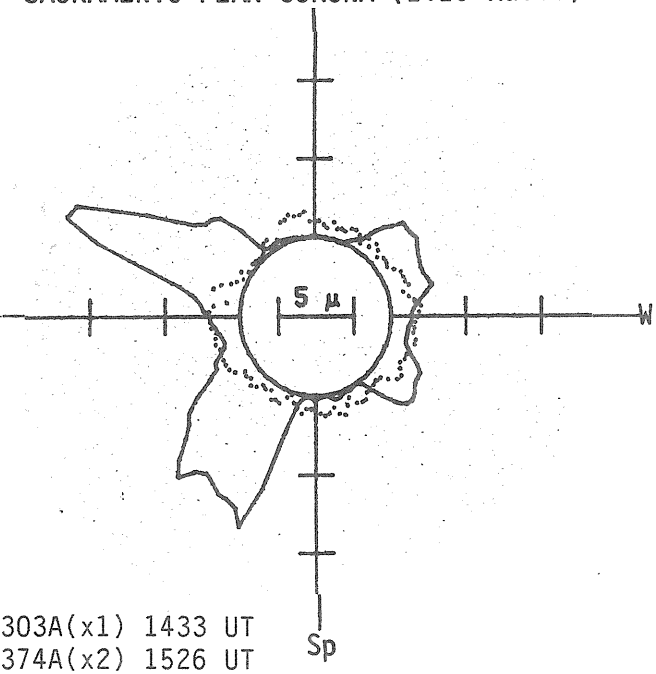


BOULDER SUNSPOTS



1325 UT
1350 UT BOUL Prom

SACRAMENTO PEAK CORONA (1.15 Radii)

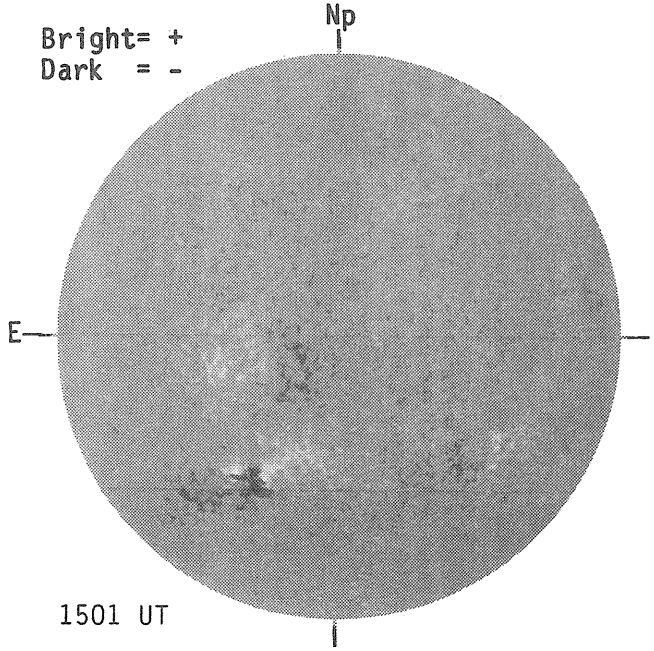


—— 5303A(x1) 1433 UT
.... 6374A(x2) 1526 UT
xxxx 5694A(x6) 1516 UT
NO 5694A ACTIVITY TODAY

M A Y 09, 1 9 8 7 (P=-22.53, B_0=-3.35, L_0= 148.62)

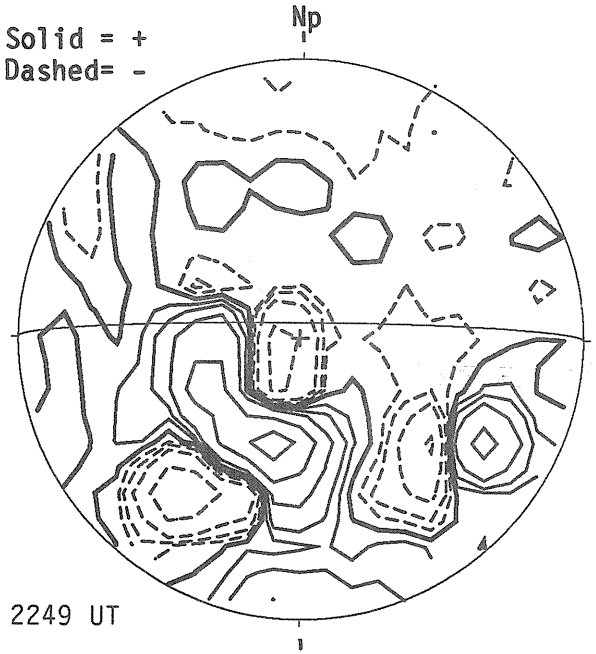
KITT PEAK MAGNETOGRAM

Bright= +
Dark = -



STANFORD MAGNETOGRAM

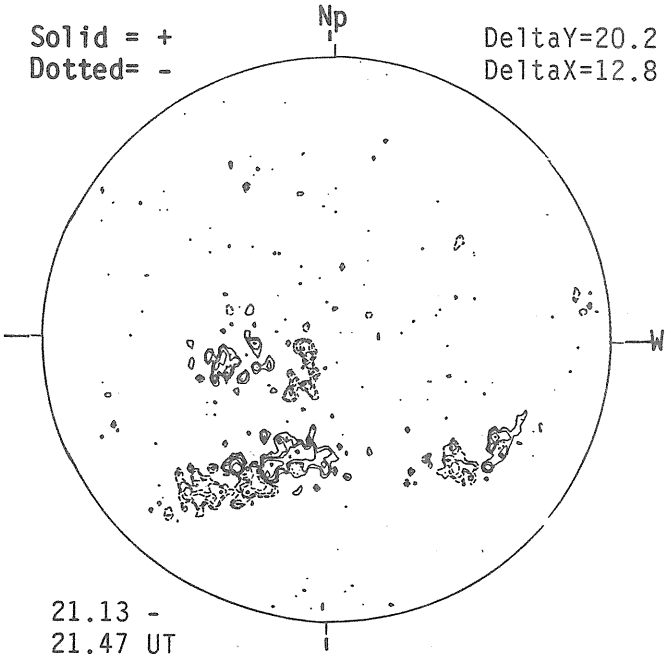
Solid = +
Dashed= -



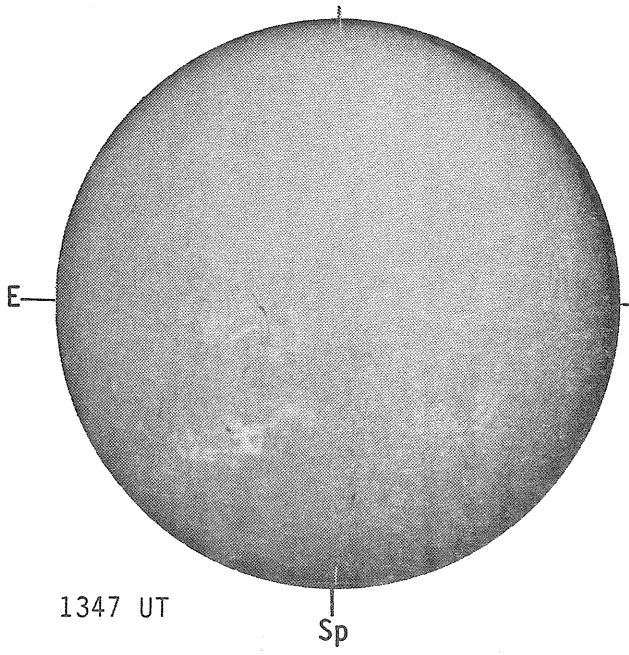
MT. WILSON MAGNETOGRAM

Solid = +
Dotted= -

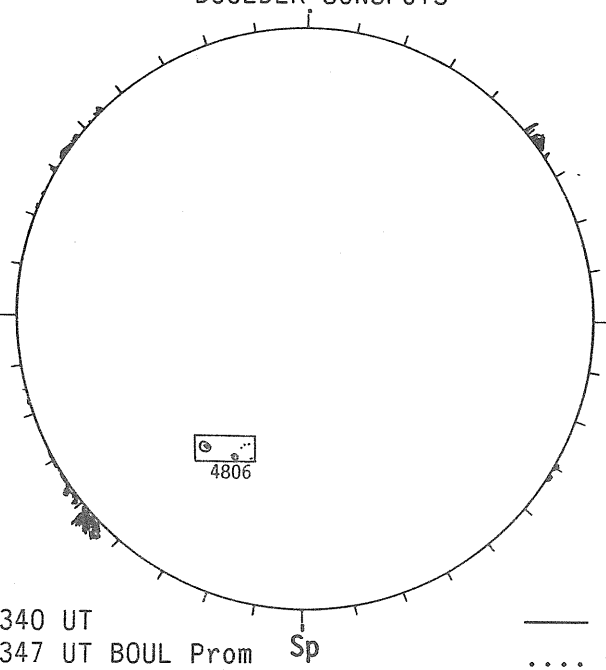
DeltaY=20.2
DeltaX=12.8



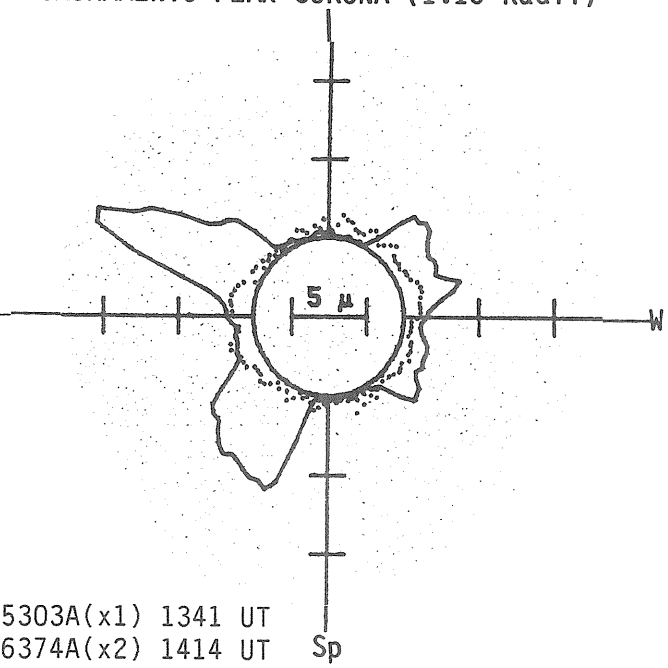
BOULDER H-ALPHA



BOULDER SUNSPOTS



SACRAMENTO PEAK CORONA (1.15 Radii)

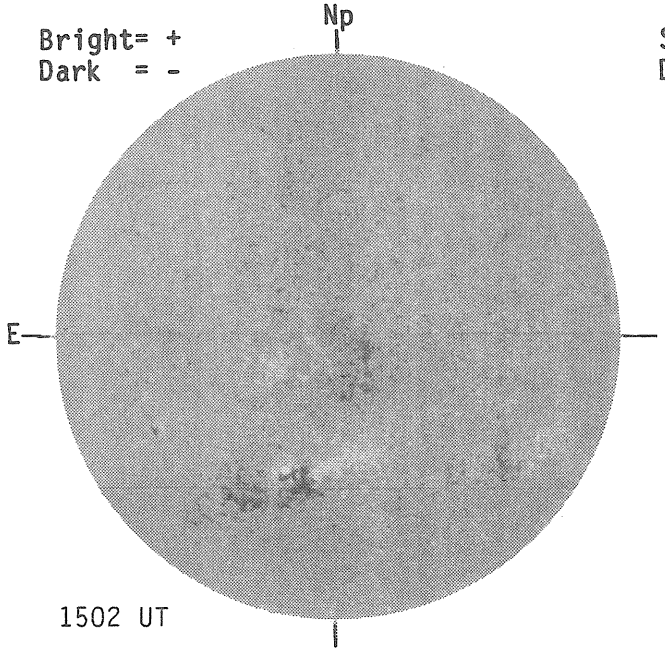


—— 5303A(x1) 1341 UT
.... 6374A(x2) 1414 UT
xxxx 5694A(x6) 1404 UT
NO 5694A ACTIVITY TODAY

M A Y 10, 1 9 8 7 (P=-22.30, B_0=-3.25, L_0= 135.39)

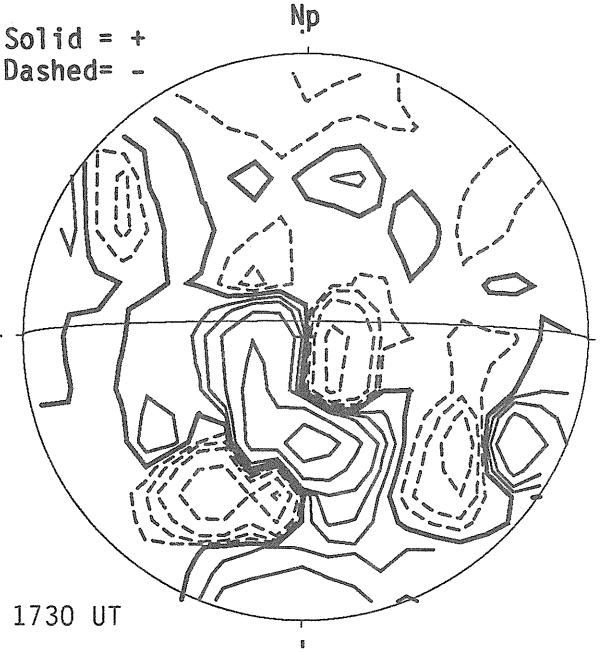
KITT PEAK MAGNETOGRAM

Bright= +
Dark = -



STANFORD MAGNETOGRAM

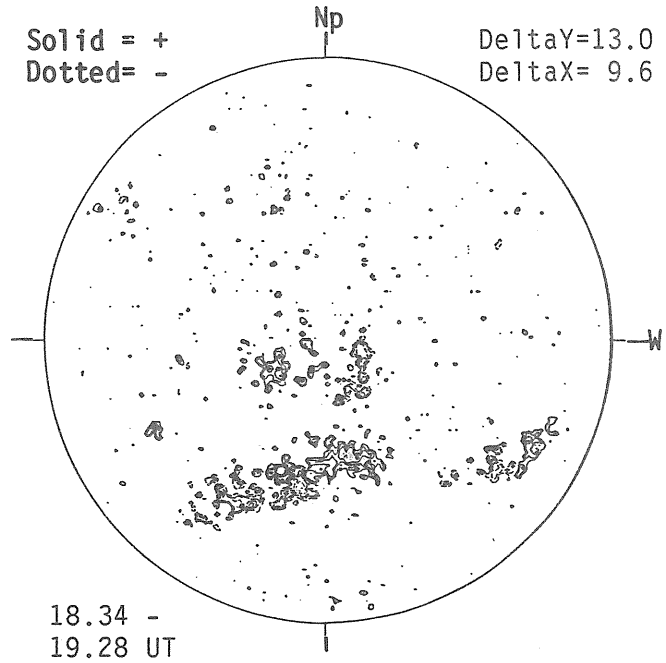
Solid = +
Dashed= -



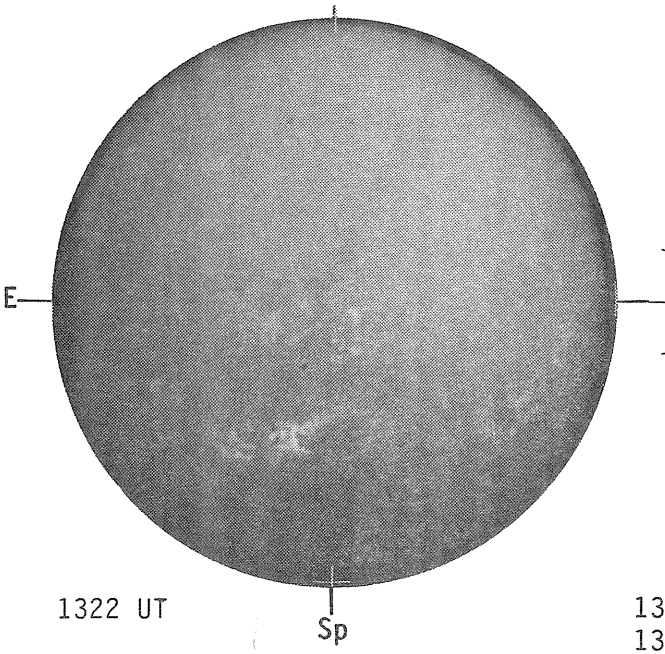
MT. WILSON MAGNETOGRAM

Solid = +
Dotted= -

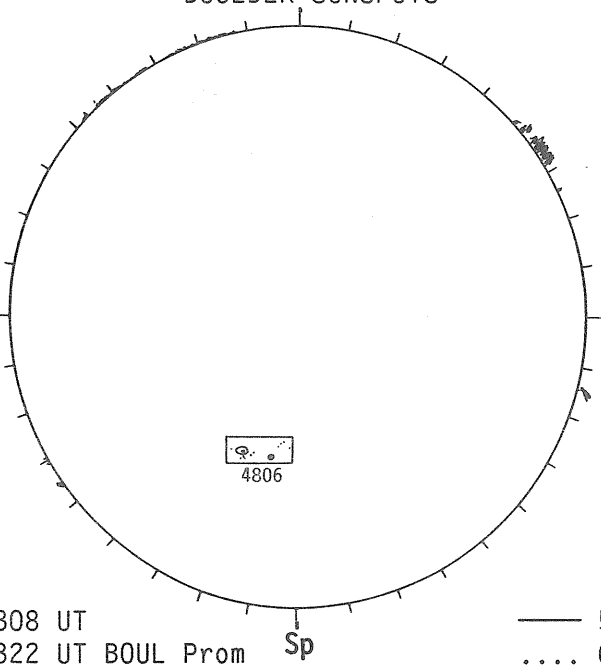
DeltaY=13.0
DeltaX= 9.6



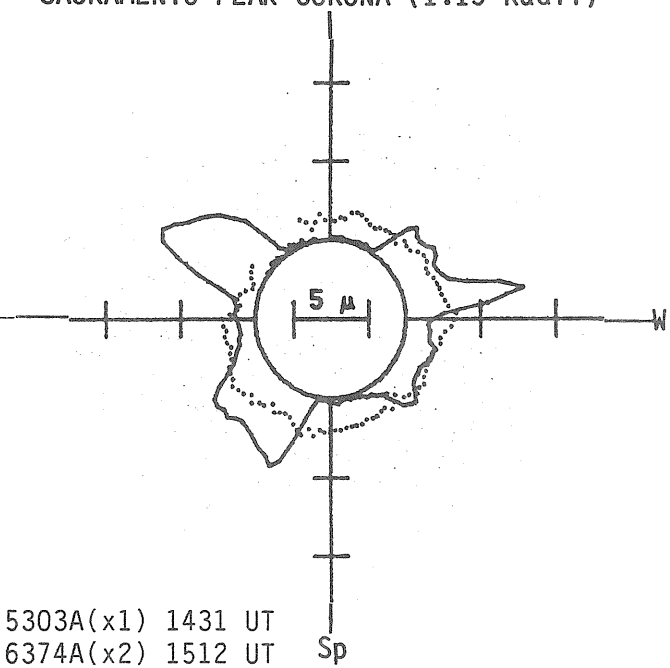
BOULDER H-ALPHA



BOULDER SUNSPOTS



SACRAMENTO PEAK CORONA (1.15 Radii)

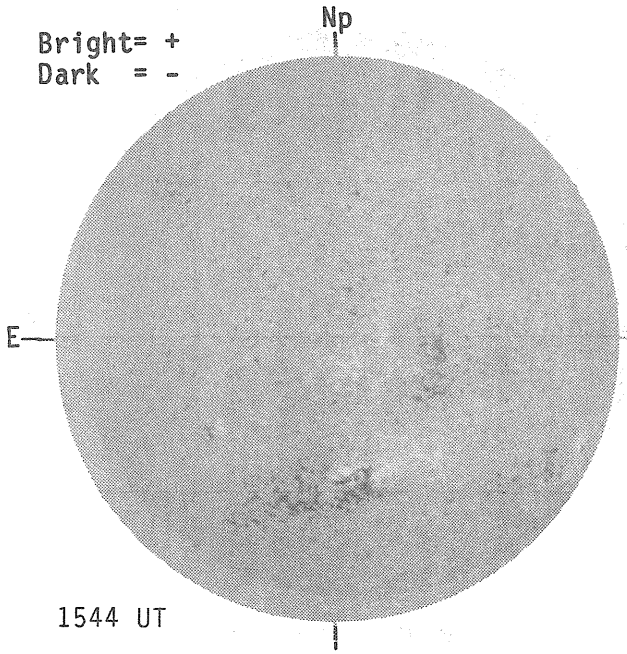


—— 5303A(x1) 1431 UT
.... 6374A(x2) 1512 UT
xxxx 5694A(x6) 1458 UT
NO 5694A ACTIVITY TODAY

M A Y 11, 1 9 8 7 (P=-22.06, B_0=-3.14, L_0= 122.17)

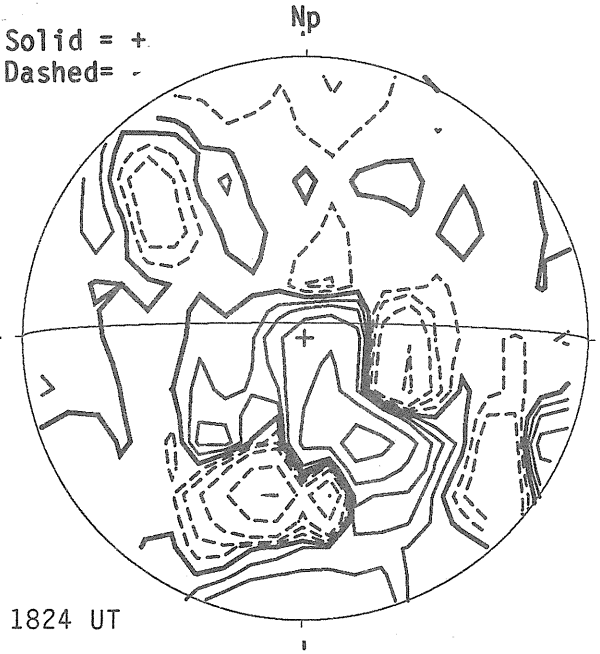
KITT PEAK MAGNETOGRAM

Bright= +
Dark = -



STANFORD MAGNETOGRAM

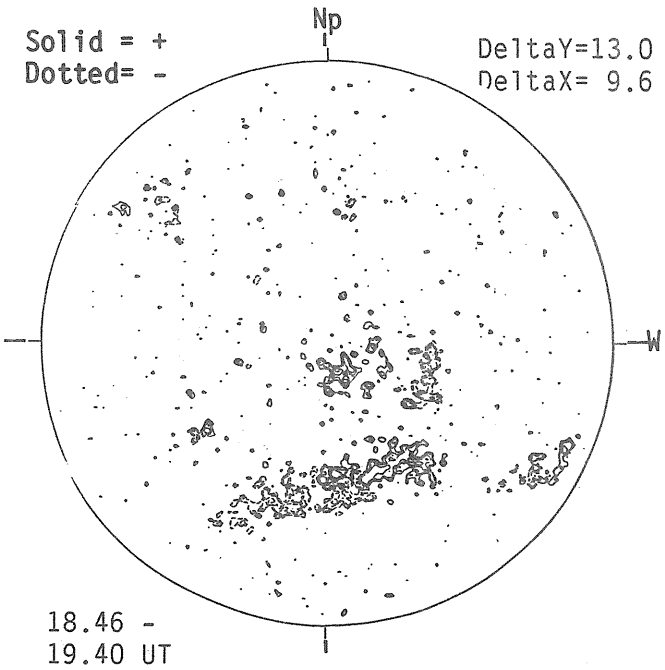
Solid = +
Dashed= -



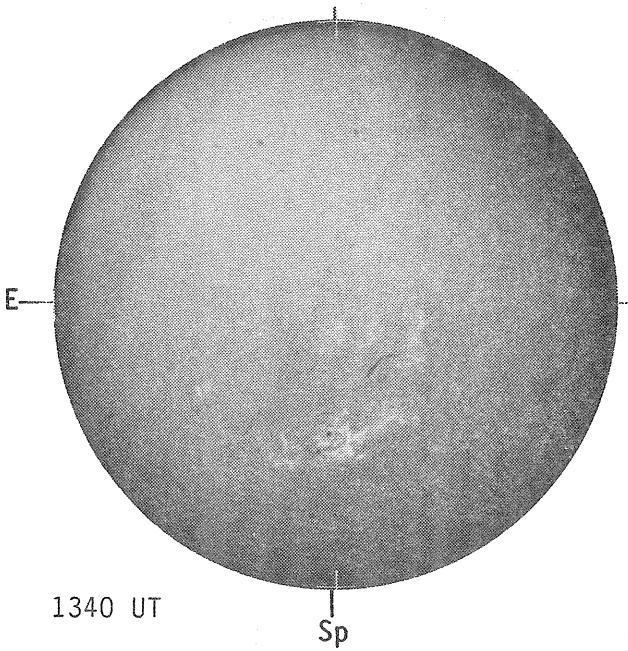
MT. WILSON MAGNETOGRAM

Solid = +
Dotted= -

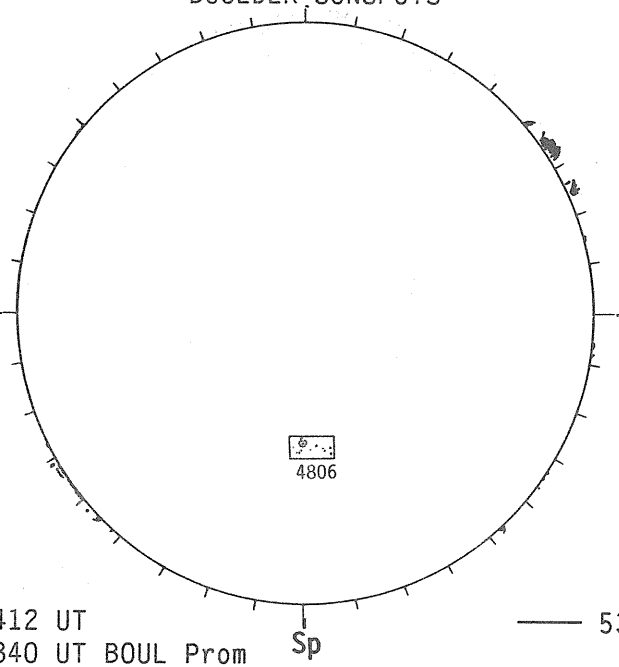
DeltaY=13.0
DeltaX= 9.6



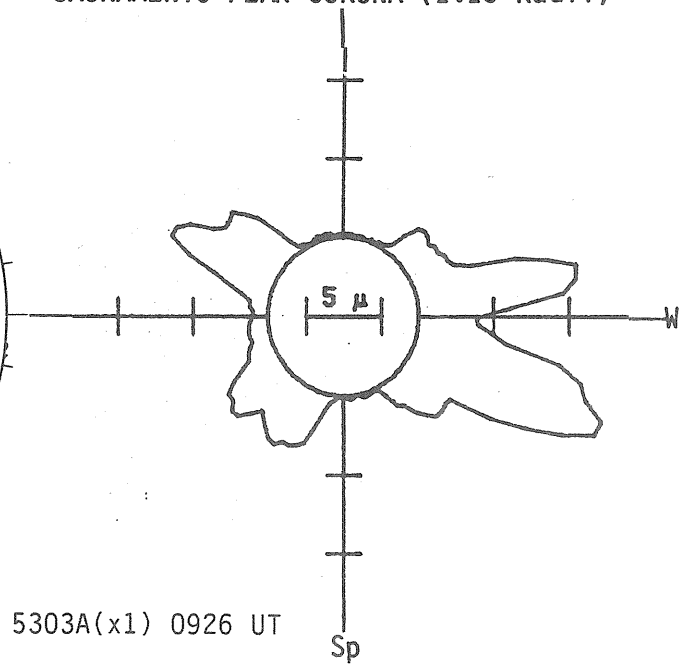
BOULDER H-ALPHA



BOULDER SUNSPOTS



SACRAMENTO PEAK CORONA (1.15 Radii)

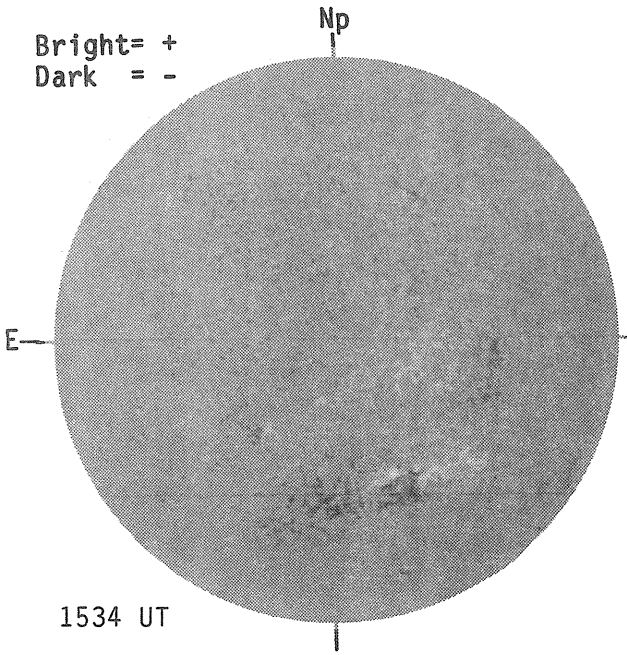


—— 5303A(x1) 0926 UT

M A Y 12, 1 9 8 7 (P=-21.81, B_0=-3.03, L_0= 108.95)

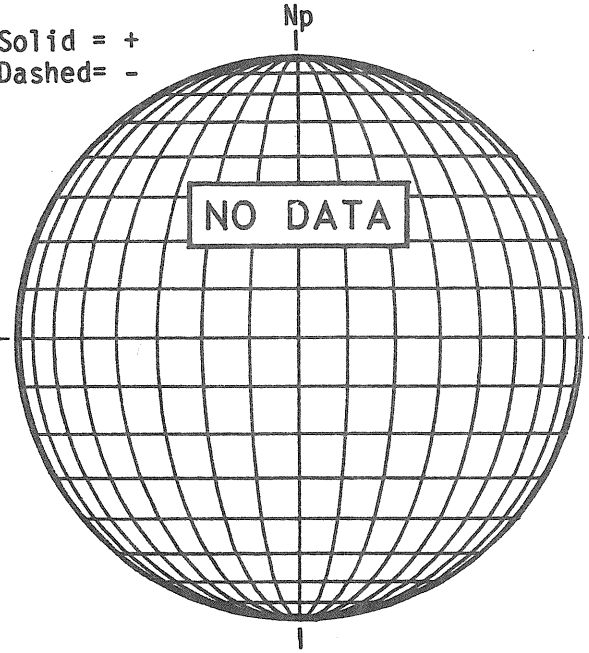
KITT PEAK MAGNETOGRAM

Bright= +
Dark = -



STANFORD MAGNETOGRAM

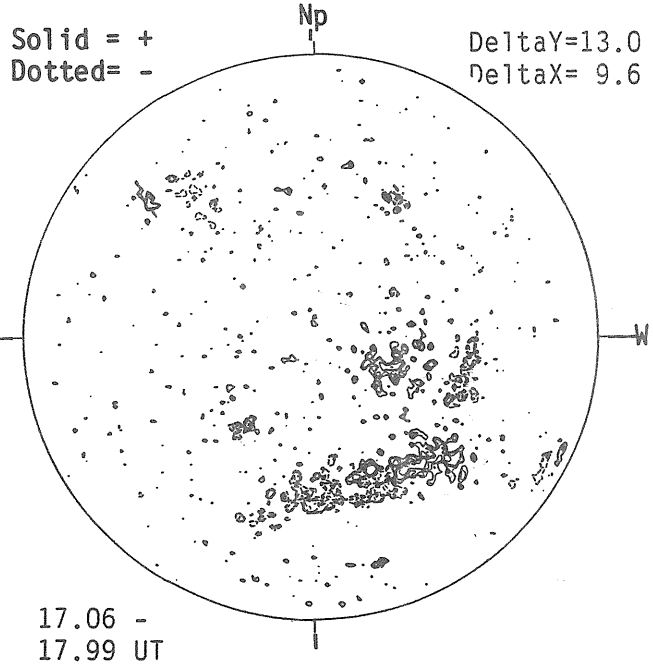
Solid = +
Dashed= -



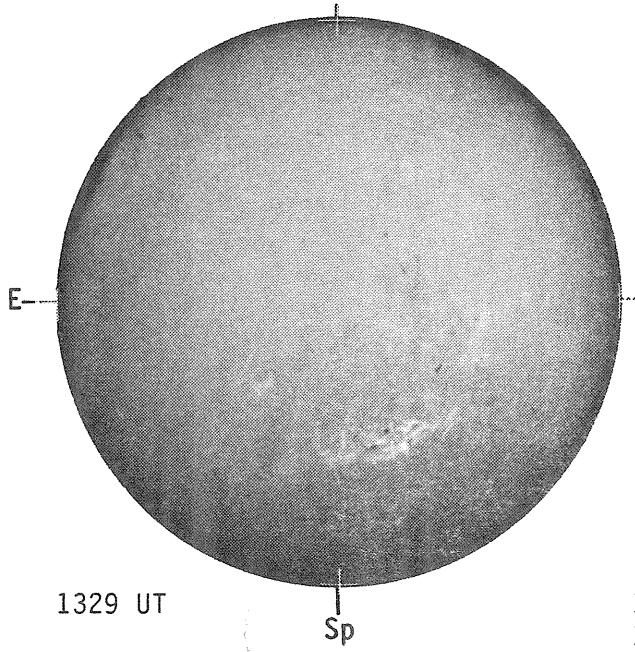
MT. WILSON MAGNETOGRAM

Solid = +
Dotted= -

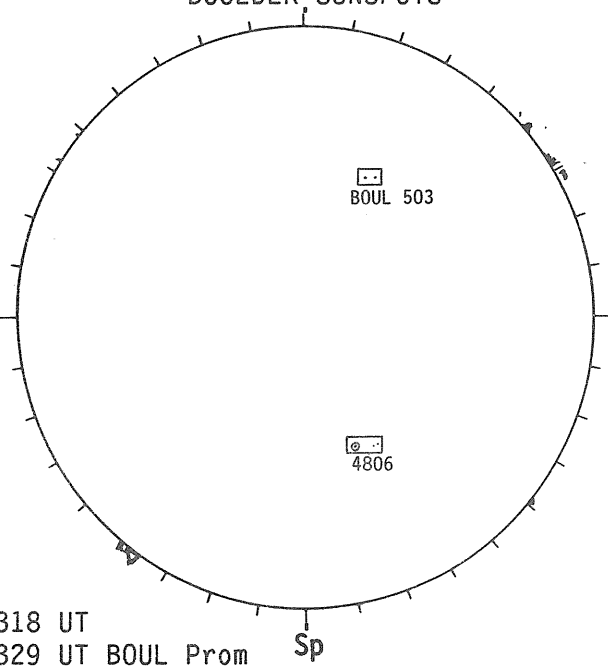
DeltaY=13.0
DeltaX= 9.6



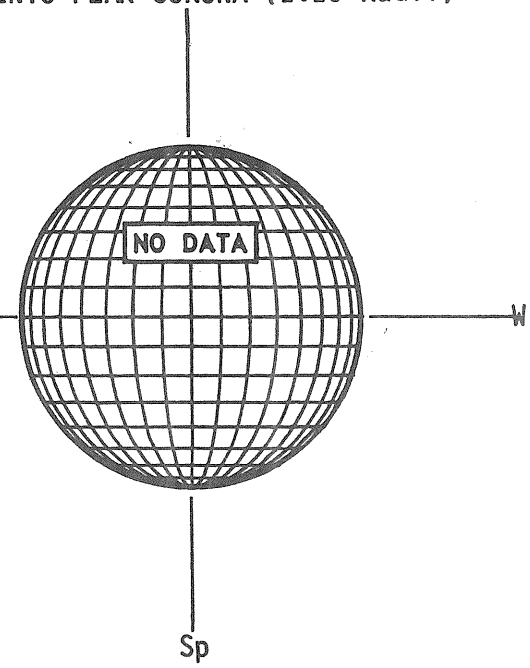
BOULDER H-ALPHA



BOULDER SUNSPOTS



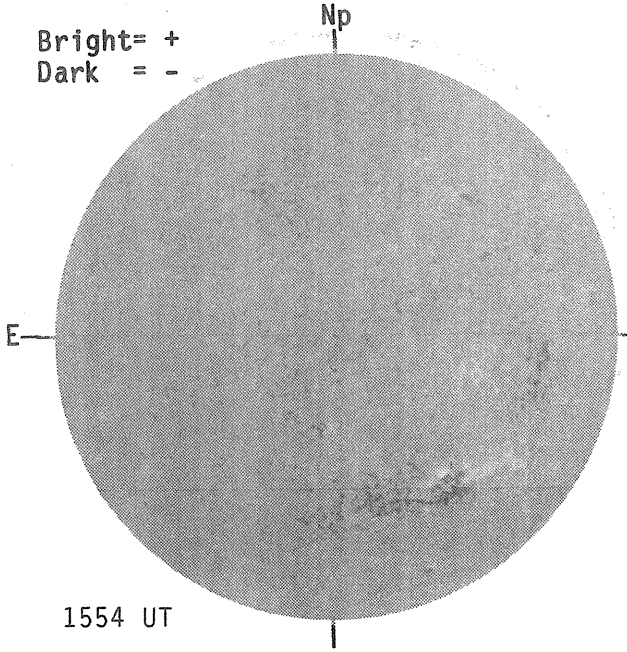
SACRAMENTO PEAK CORONA (1.15 Radii)



M A Y 13, 1 9 8 7 (P=-21.56, B_0=-2.92, L_0= 95.72)

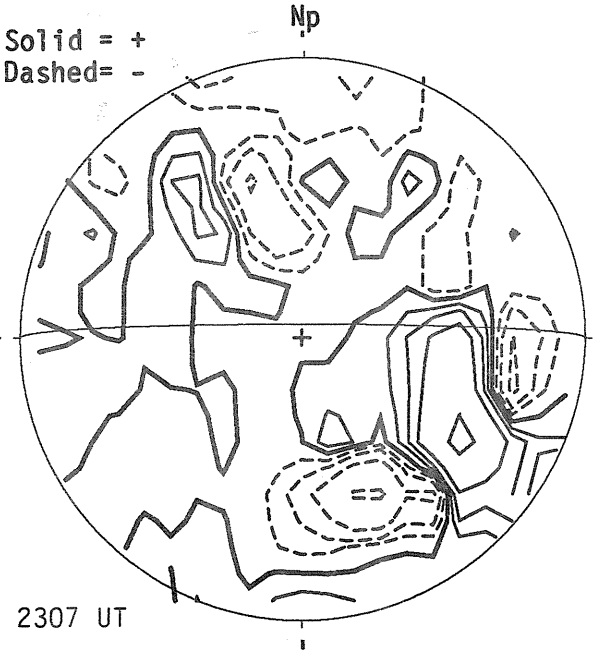
KITT PEAK MAGNETOGRAM

Bright= +
Dark = -



STANFORD MAGNETOGRAM

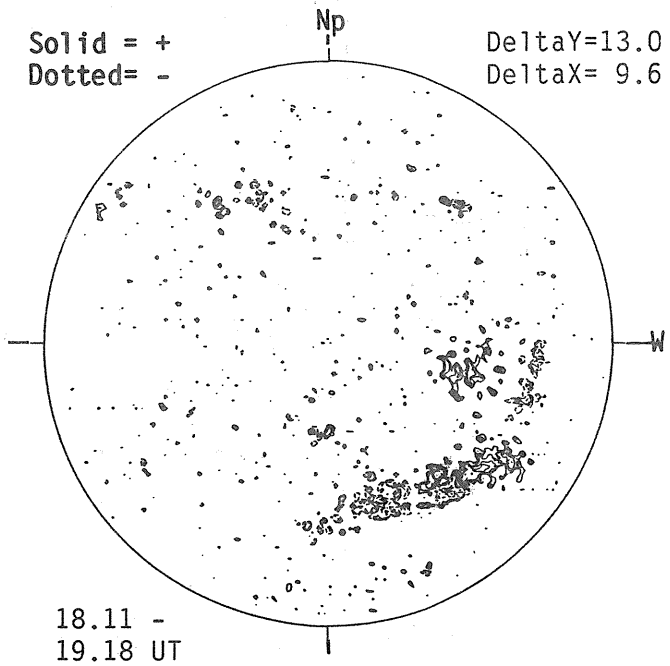
Solid = +
Dashed= -



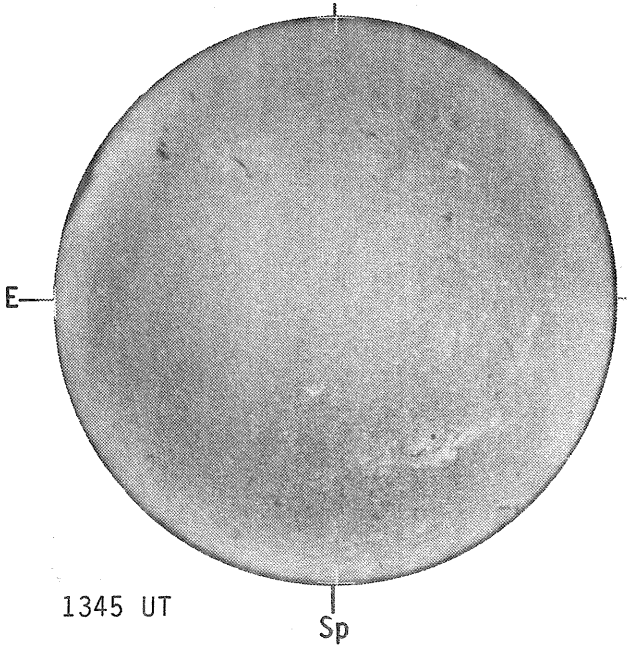
MT. WILSON MAGNETOGRAM

Solid = +
Dotted= -

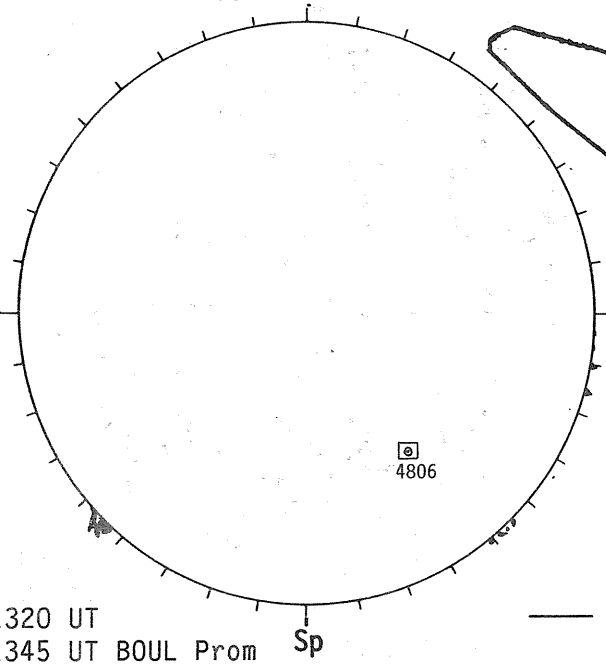
DeltaY=13.0
DeltaX= 9.6



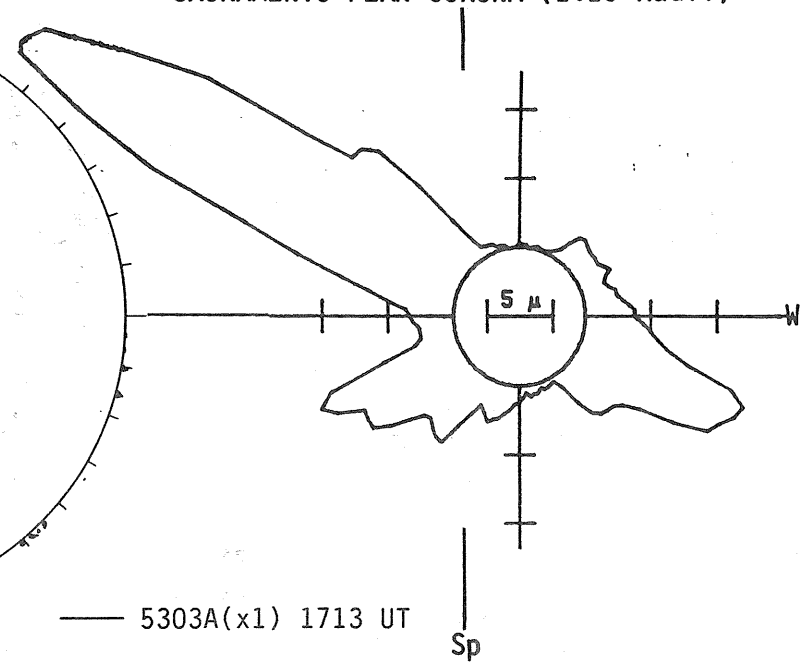
BOULDER H-ALPHA



BOULDER SUNSPOTS

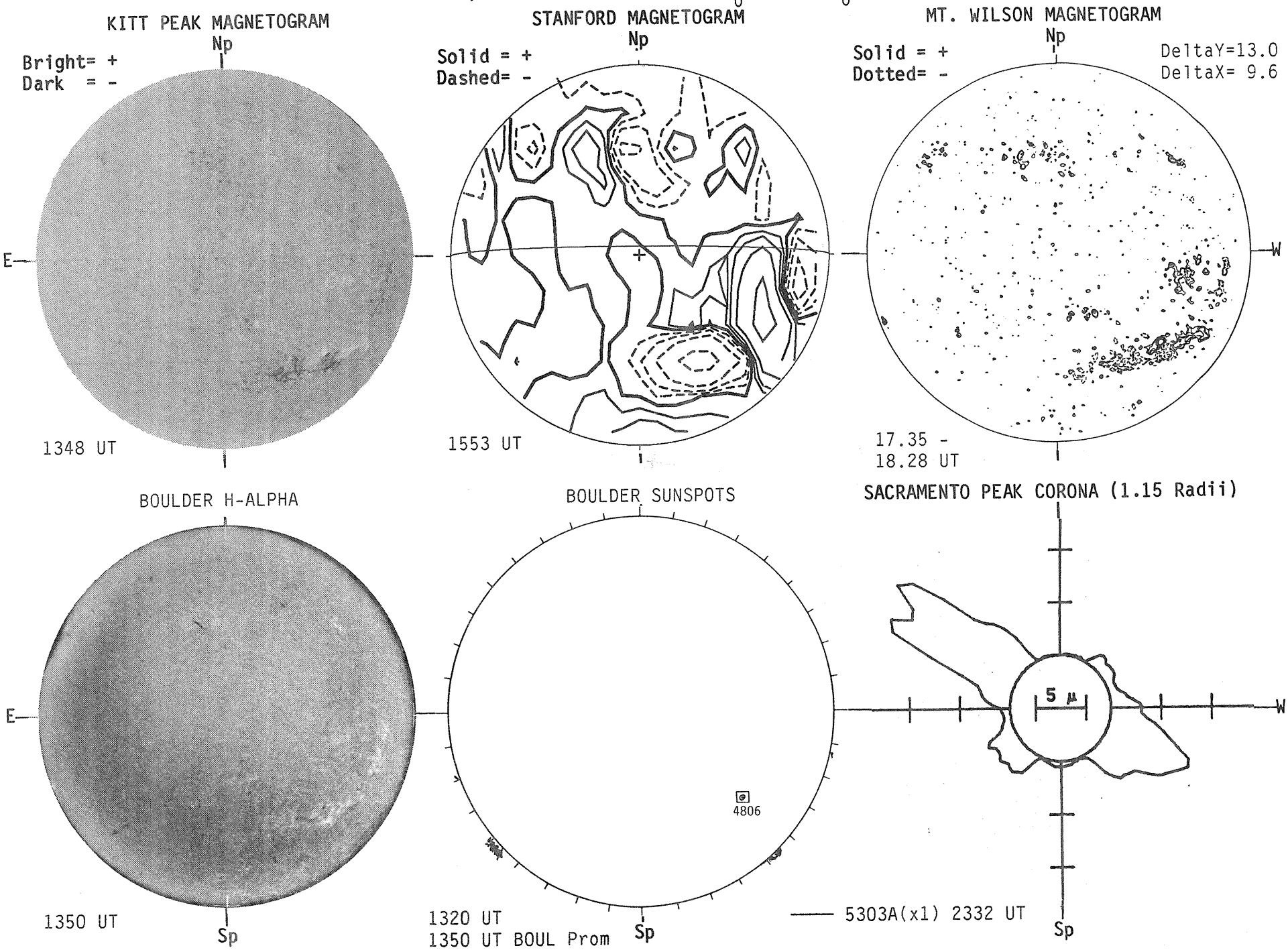


SACRAMENTO PEAK CORONA (1.15 Radii)



—— 5303A(x1) 1713 UT

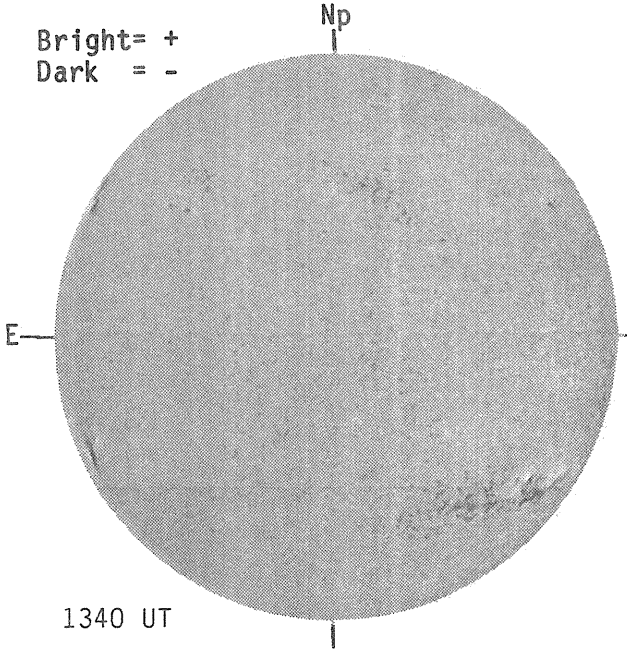
M A Y 14, 1 9 8 7 (P=-21.30, B_0=-2.81, L_0= 82.50)



M A Y 15, 1 9 8 7 (P=-21.03, B_0=-2.70, L_0= 69.27)

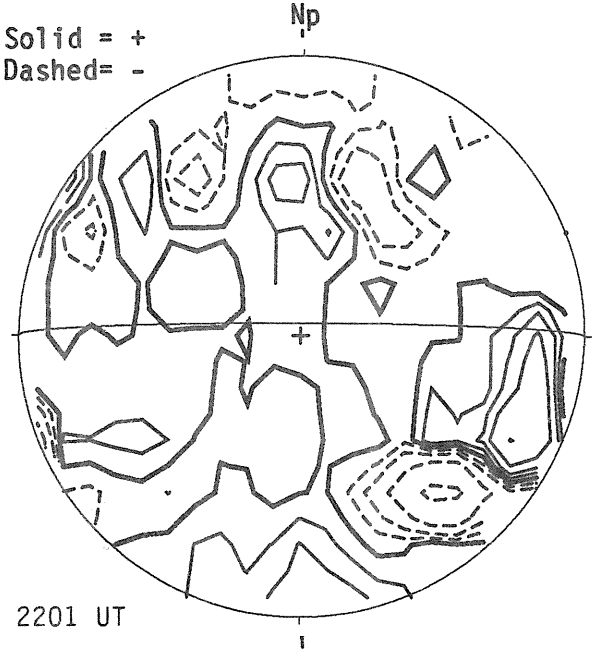
KITT PEAK MAGNETOGRAM

Bright= +
Dark = -



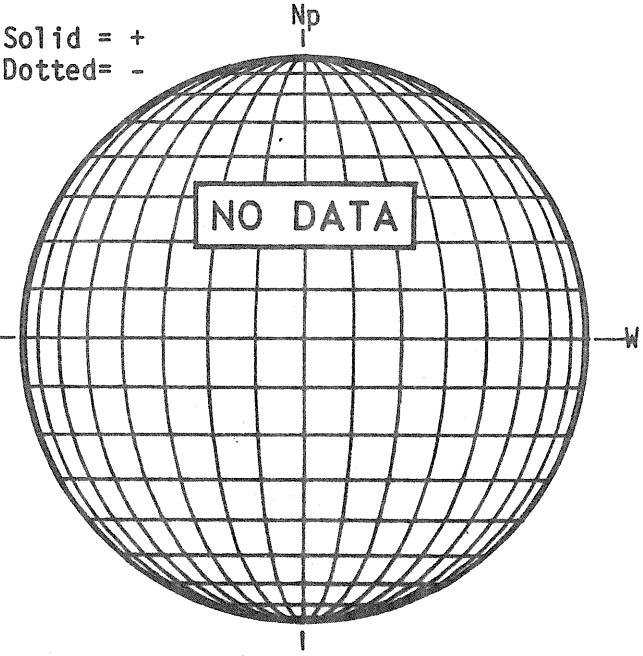
STANFORD MAGNETOGRAM

Solid = +
Dashed= -

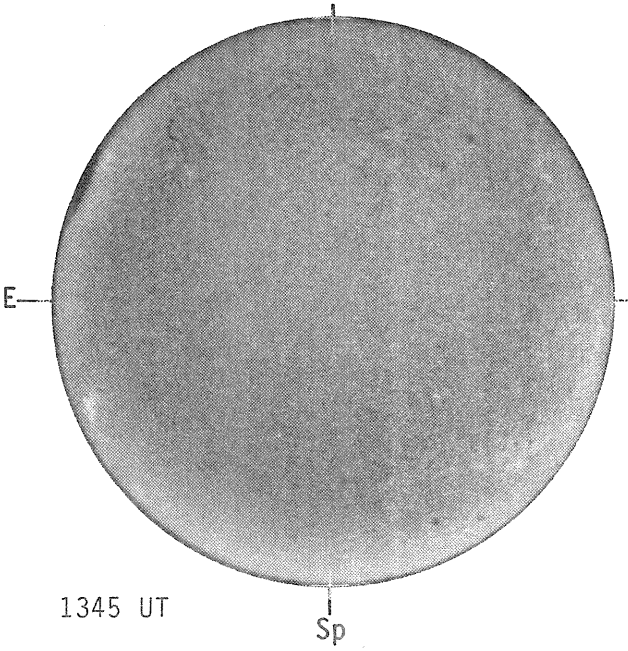


MT. WILSON MAGNETOGRAM

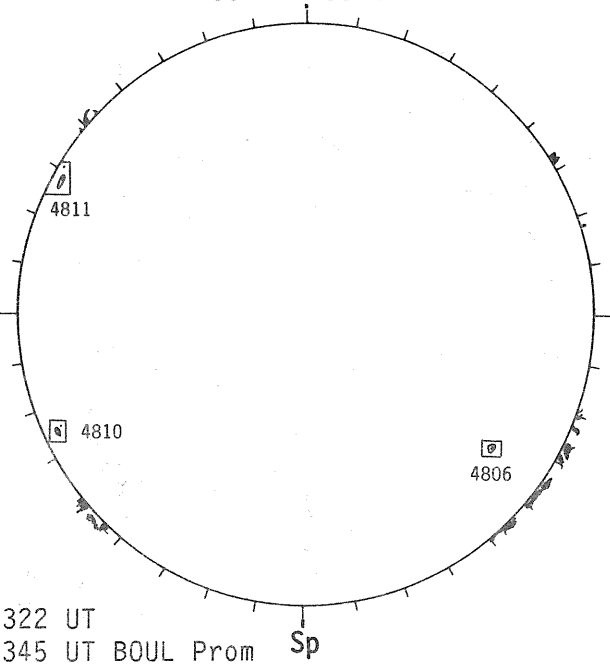
Solid = +
Dotted= -



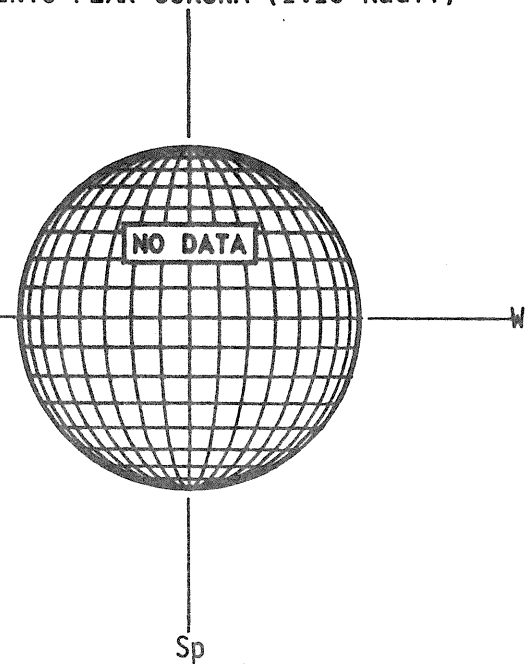
BOULDER H-ALPHA



BOULDER SUNSPOTS

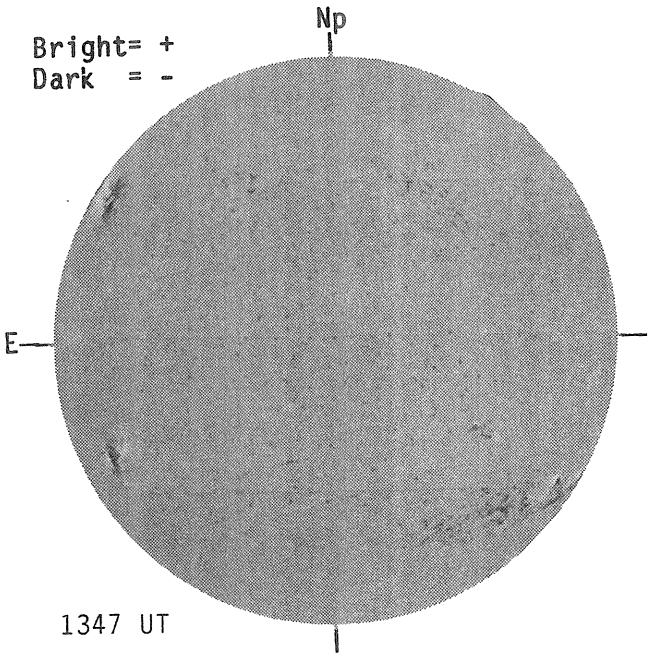


SACRAMENTO PEAK CORONA (1.15 Radii)

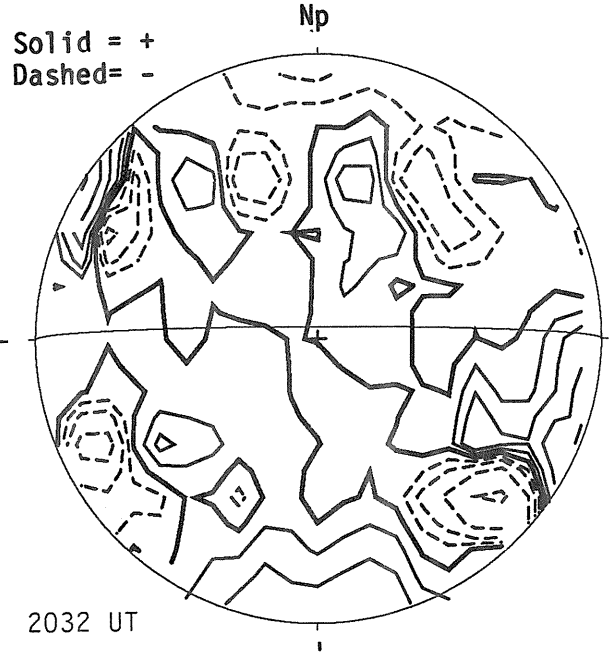


M A Y 16, 1 9 8 7 (P=-20.76, B_0=-2.59, L_0= 56.05)

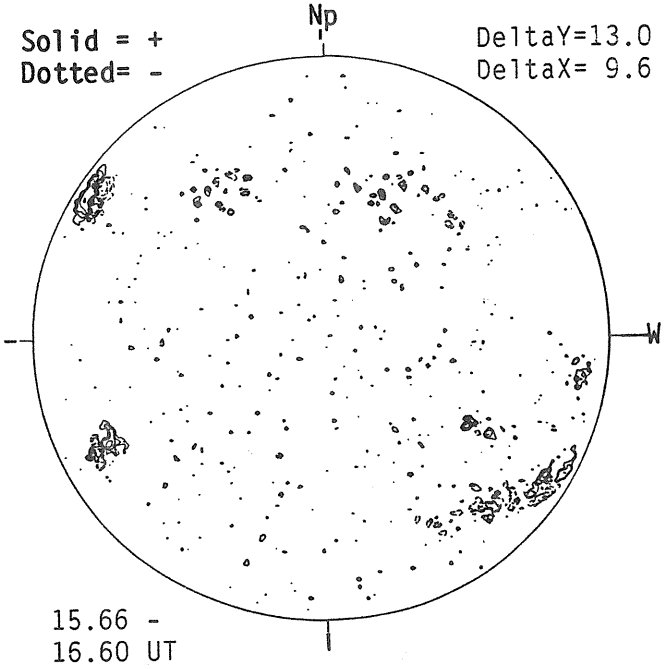
KITT PEAK MAGNETOGRAM



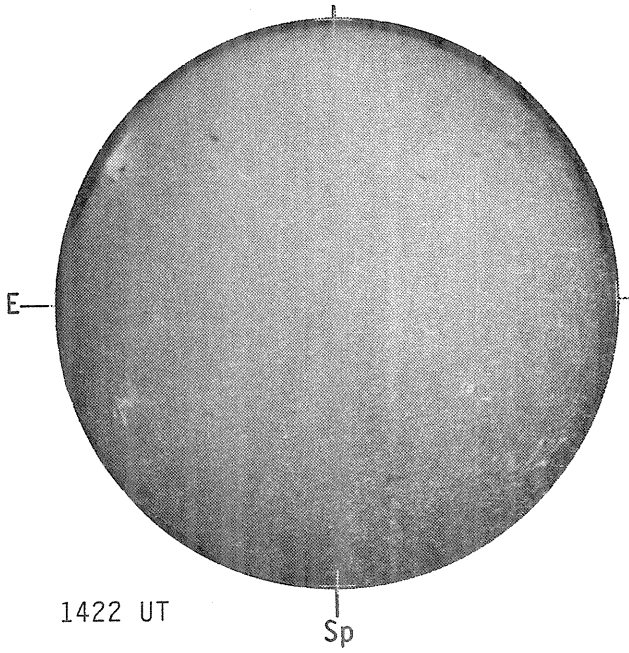
STANFORD MAGNETOGRAM



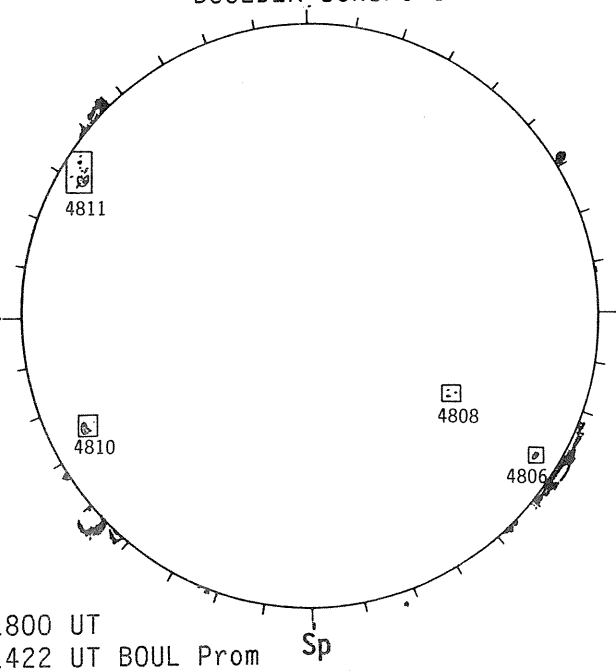
MT. WILSON MAGNETOGRAM



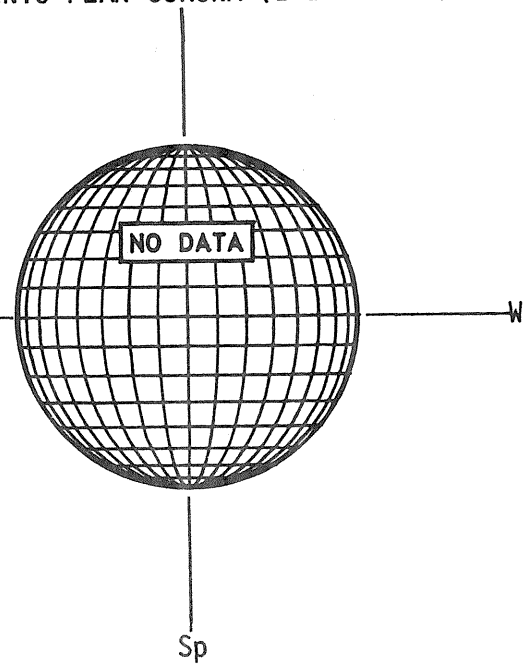
BOULDER H-ALPHA



BOULDER SUNSPOTS



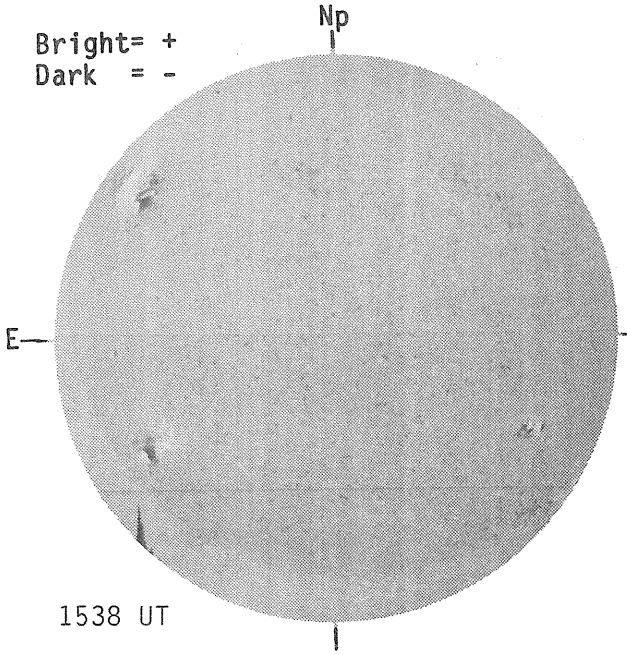
SACRAMENTO PEAK CORONA (1.15 Radii)



M A Y 17, 1 9 8 7 (P=-20.48, B_0=-2.48, L_0= 42.82)

KITT PEAK MAGNETOGRAM

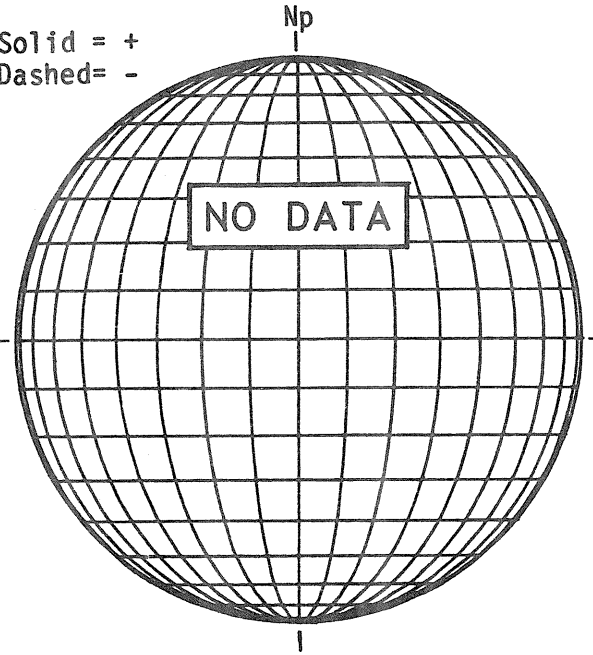
Bright= +
Dark = -



1538 UT

STANFORD MAGNETOGRAM

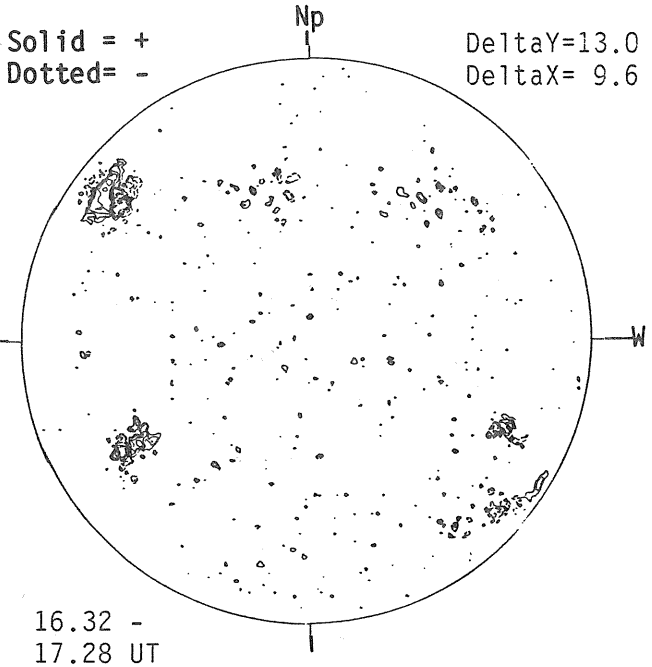
Solid = +
Dashed= -



MT. WILSON MAGNETOGRAM

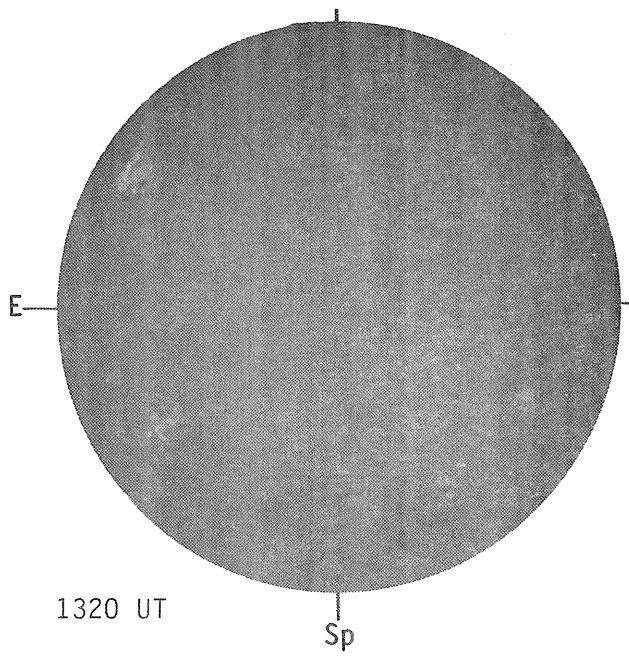
Solid = +
Dotted= -

DeltaY=13.0
DeltaX= 9.6



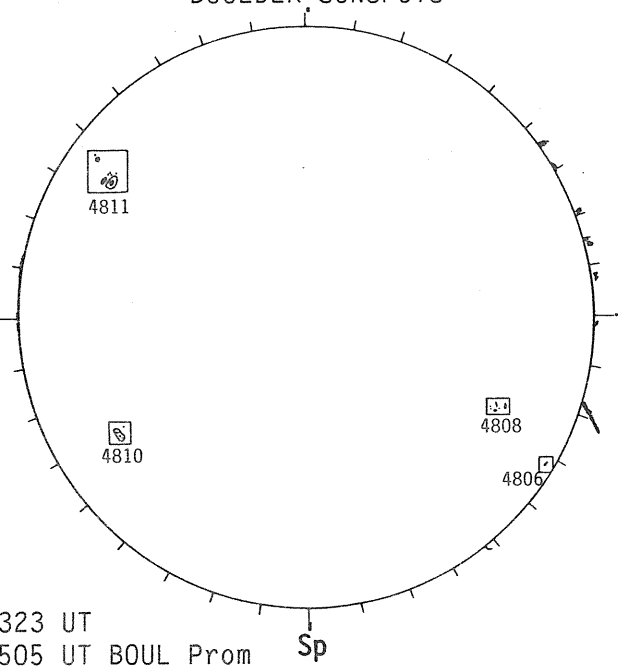
16.32 -
17.28 UT

SACRAMENTO PEAK H-ALPHA



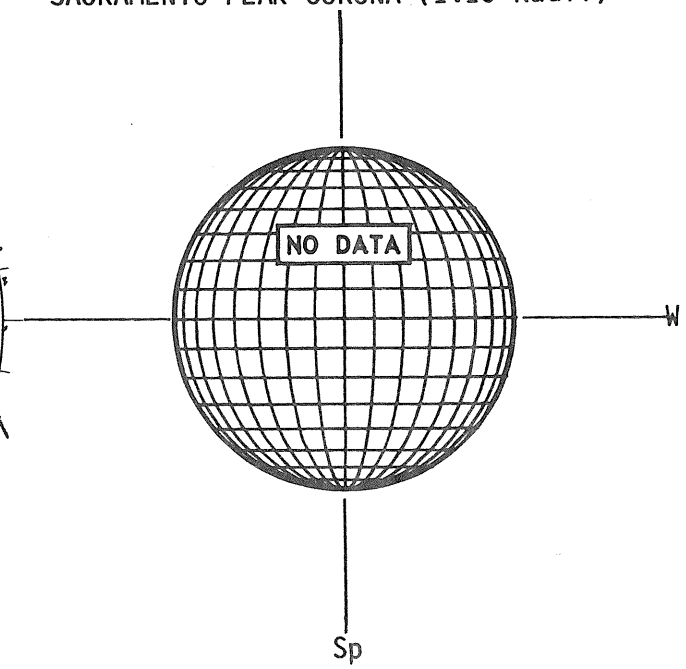
1320 UT

BOULDER SUNSPOTS



1323 UT
1505 UT BOUL Prom

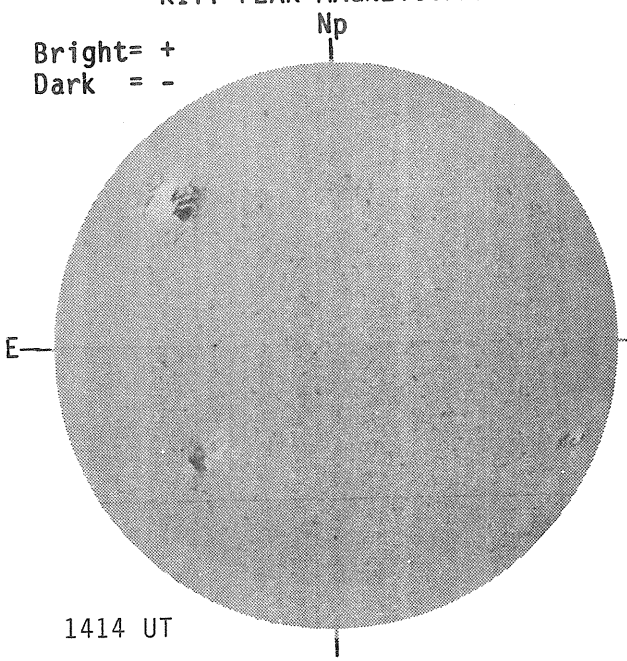
SACRAMENTO PEAK CORONA (1.15 Radii)



M A Y 18, 1 9 8 7 (P=-20.19, B_0=-2.37, L_0= 29.59)

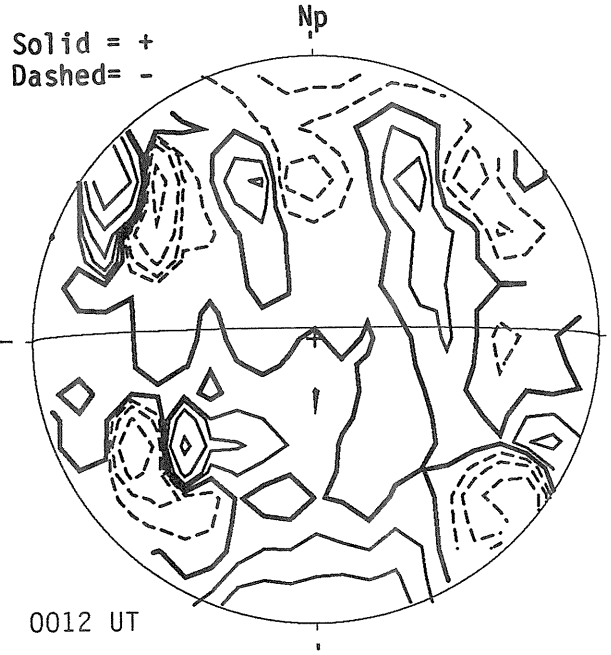
KITT PEAK MAGNETOGRAM

Bright= +
Dark = -



STANFORD MAGNETOGRAM

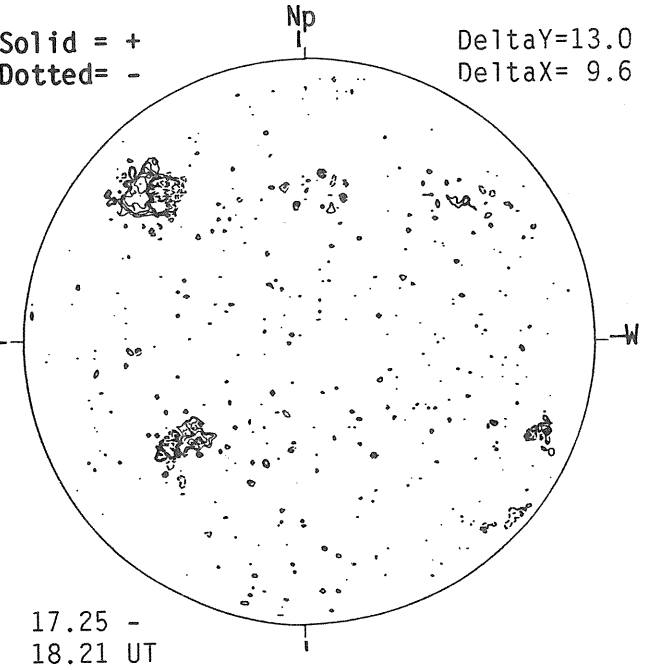
Solid = +
Dashed= -



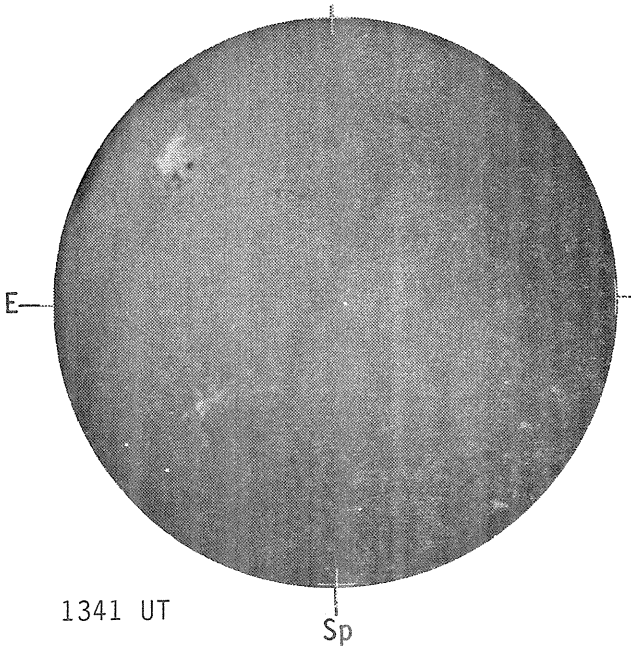
MT. WILSON MAGNETOGRAM

Solid = +
Dotted= -

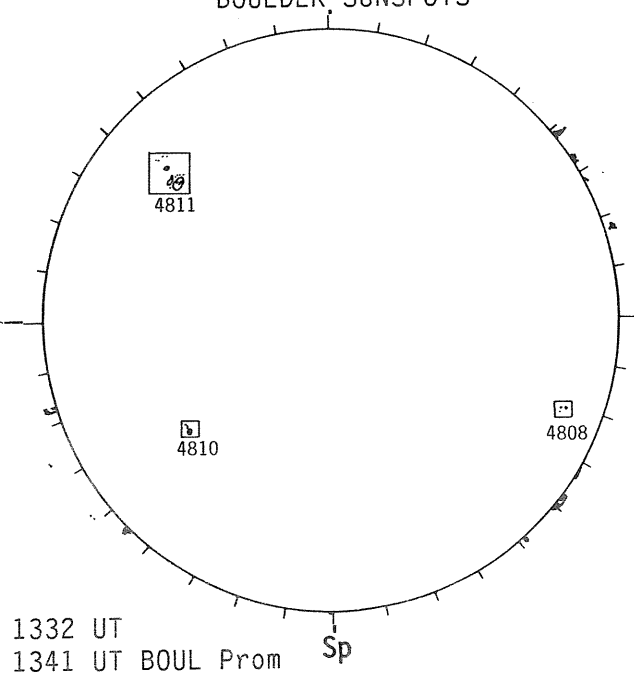
DeltaY=13.0
DeltaX= 9.6



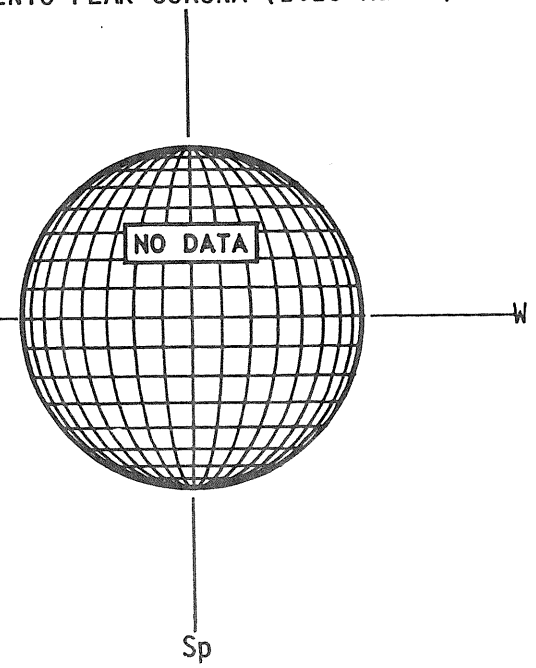
BOULDER H-ALPHA



BOULDER SUNSPOTS



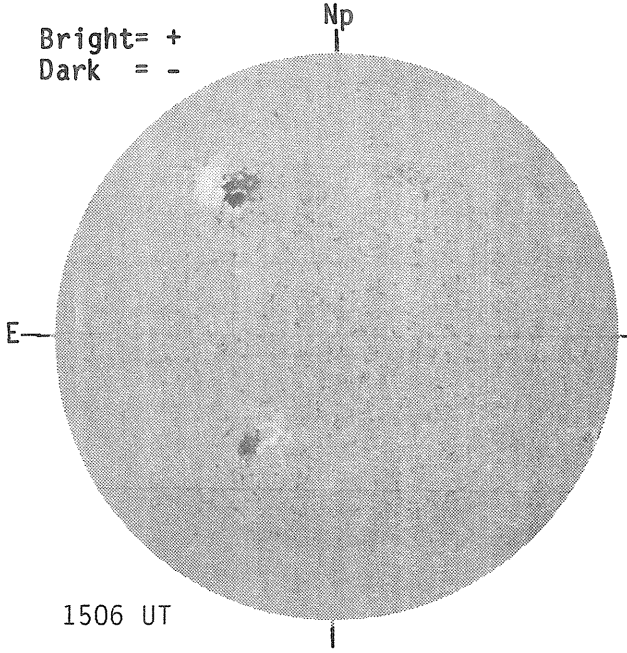
SACRAMENTO PEAK CORONA (1.15 Radii)



M A Y 19, 1 9 8 7 (P=-19.90, B_0=-2.25, L_0= 16.37)

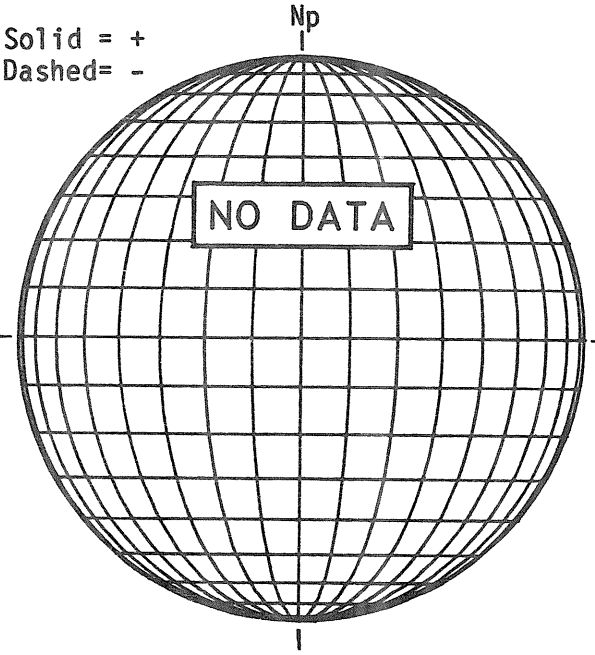
KITT PEAK MAGNETOGRAM

Bright= +
Dark = -



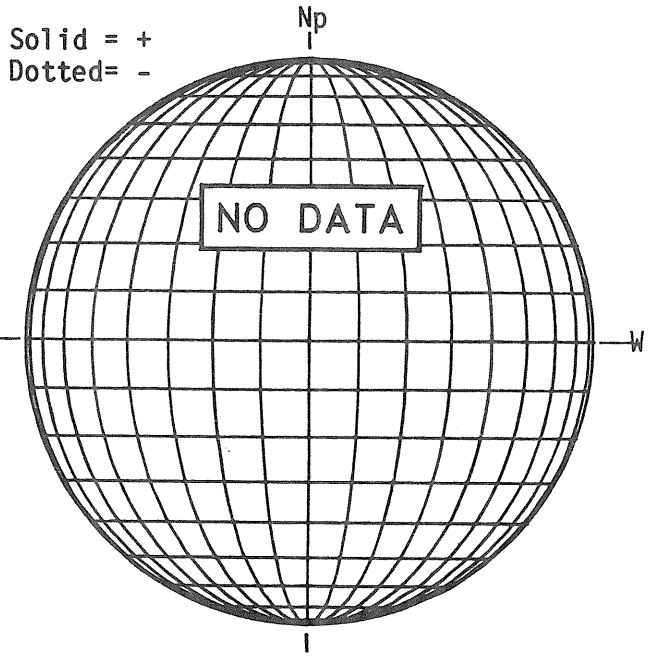
STANFORD MAGNETOGRAM

Solid = +
Dashed= -

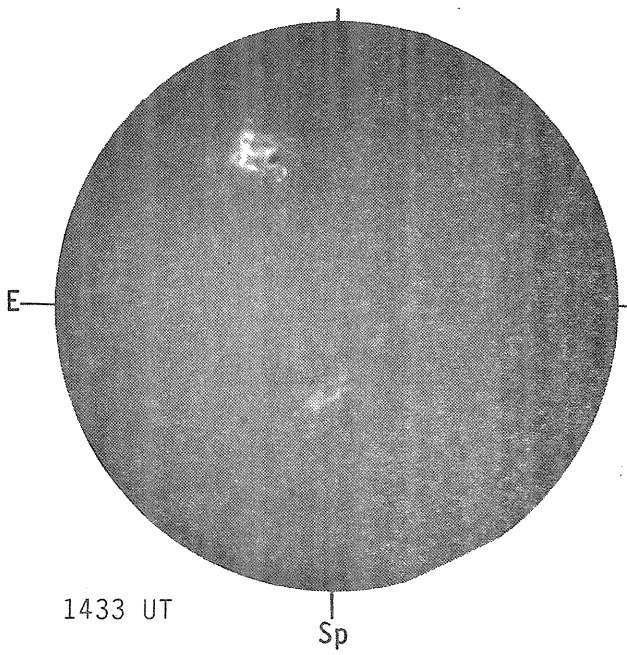


MT. WILSON MAGNETOGRAM

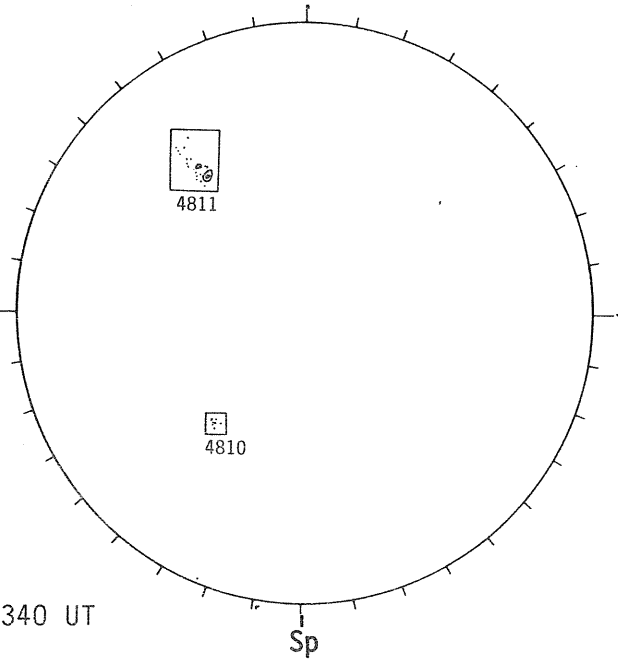
Solid = +
Dotted= -



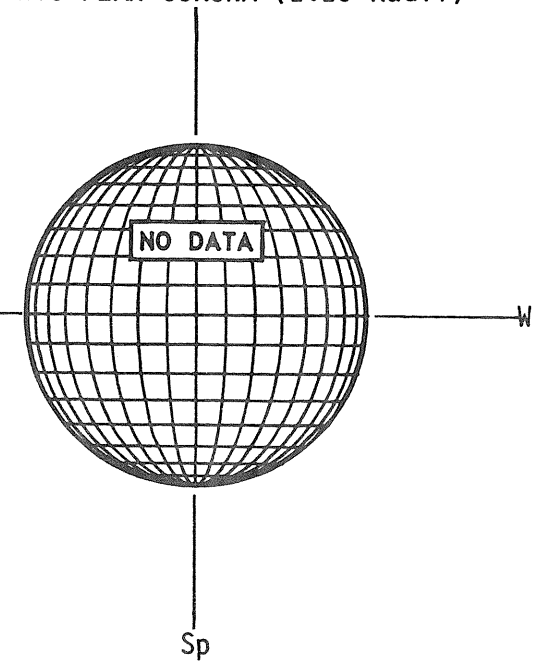
SACRAMENTO PEAK H-ALPHA



BOULDER SUNSPOTS



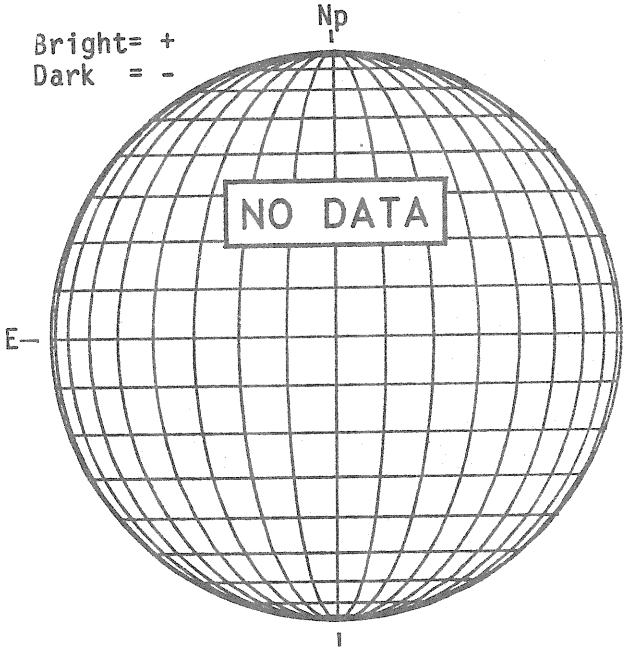
SACRAMENTO PEAK CORONA (1.15 Radii)



M A Y 20, 1 9 8 7 (P=-19.60, B_0=-2.14, L_0= 3.14)

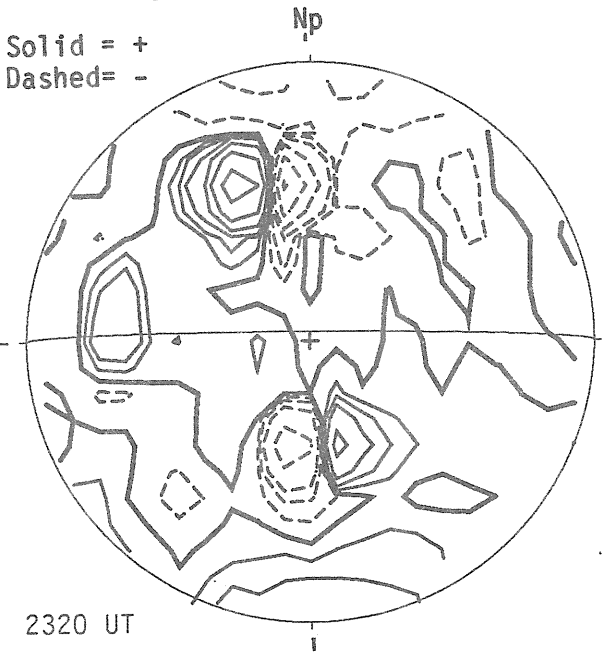
KITT PEAK MAGNETOGRAM

Bright= +
Dark = -



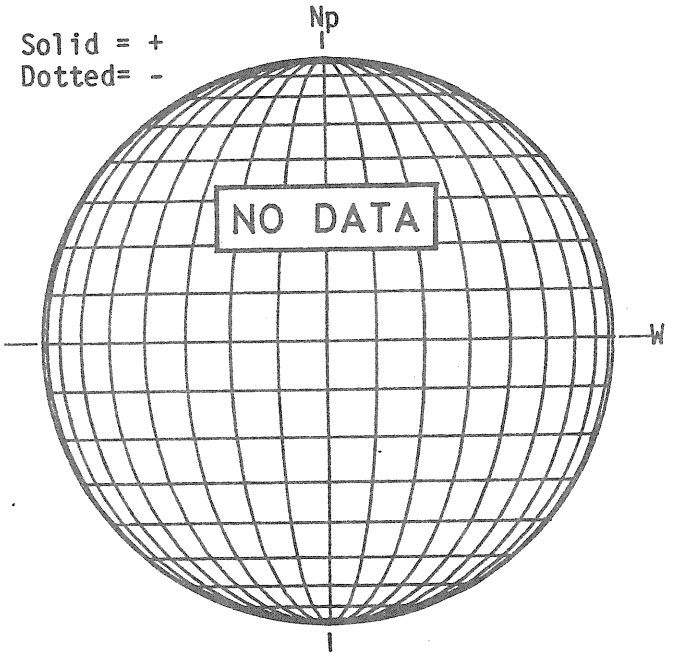
STANFORD MAGNETOGRAM

Solid = +
Dashed= -

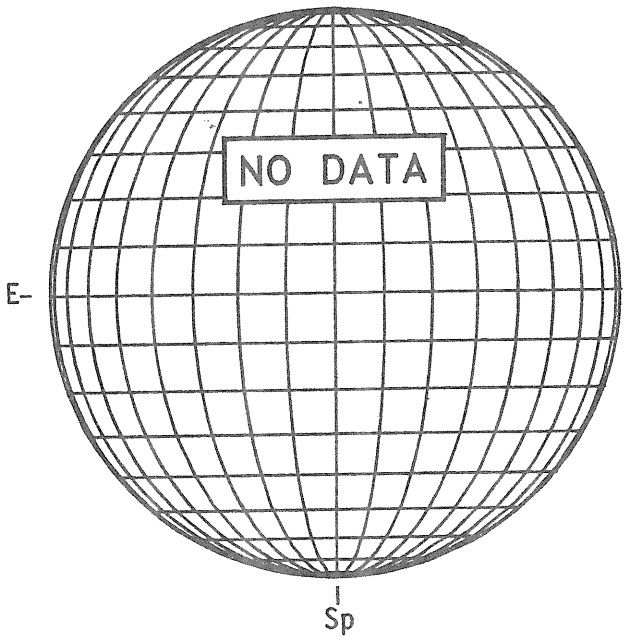


MT. WILSON MAGNETOGRAM

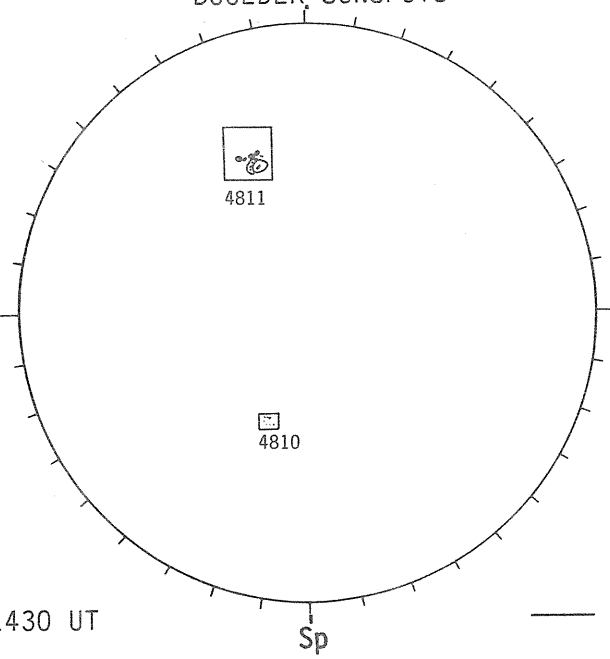
Solid = +
Dotted= -



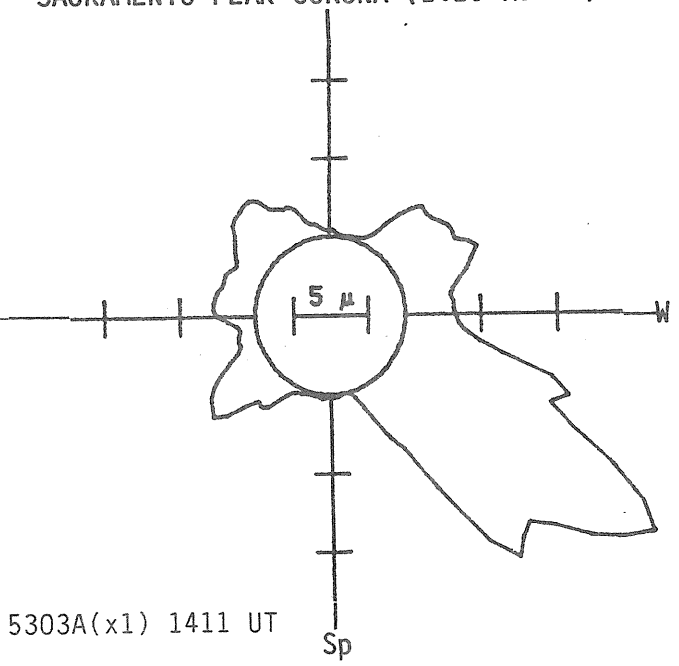
BOULDER H-ALPHA



BOULDER SUNSPOTS



SACRAMENTO PEAK CORONA (1.15 Radii)

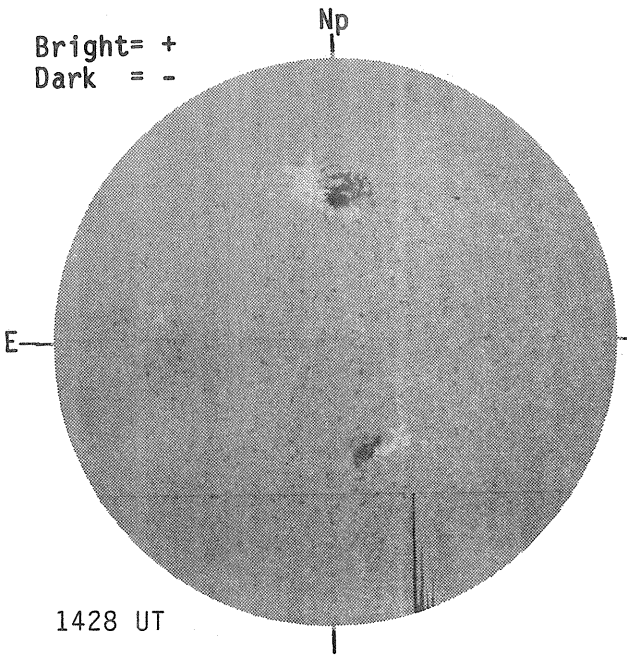


—— 5303A(x1) 1411 UT

M A Y 21, 1 9 8 7 (P=-19.29, B_0=-2.02, L_0= 349.91)

KITT PEAK MAGNETOGRAM

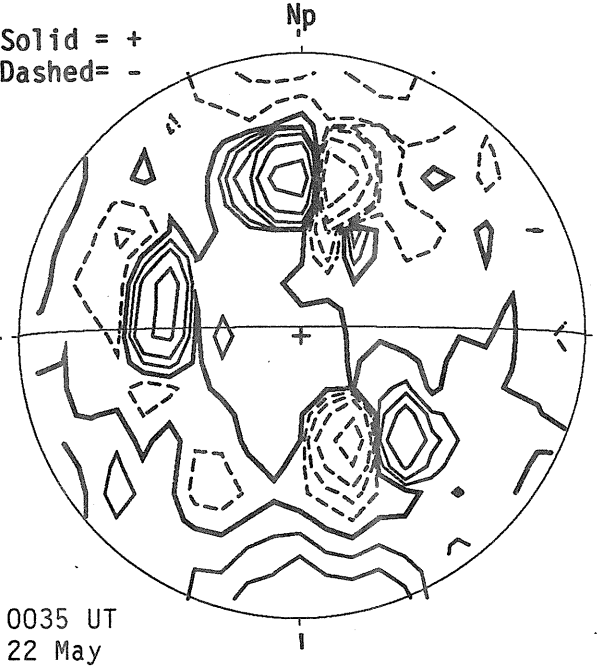
Bright= +
Dark = -



1428 UT

STANFORD MAGNETOGRAM

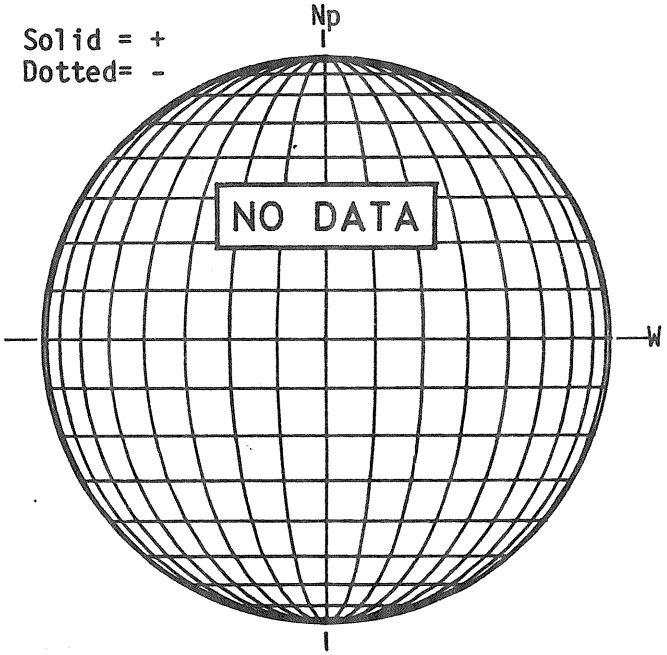
Solid = +
Dashed= -



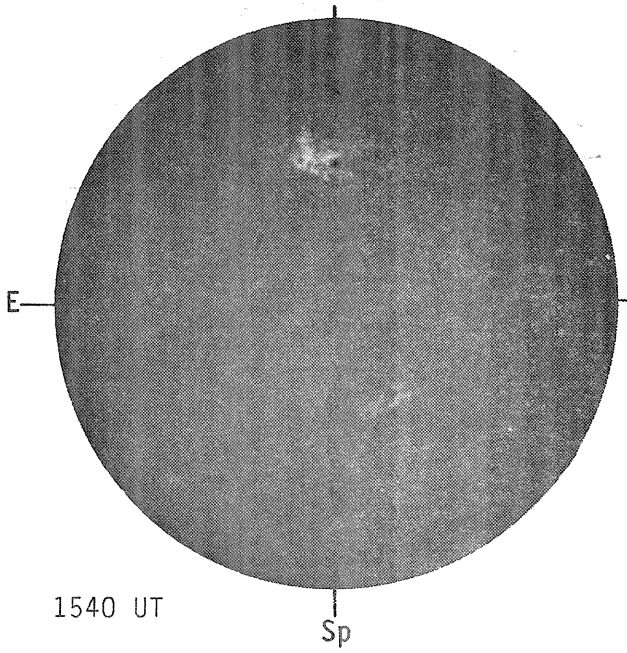
0035 UT
22 May

MT. WILSON MAGNETOGRAM

Solid = +
Dotted= -

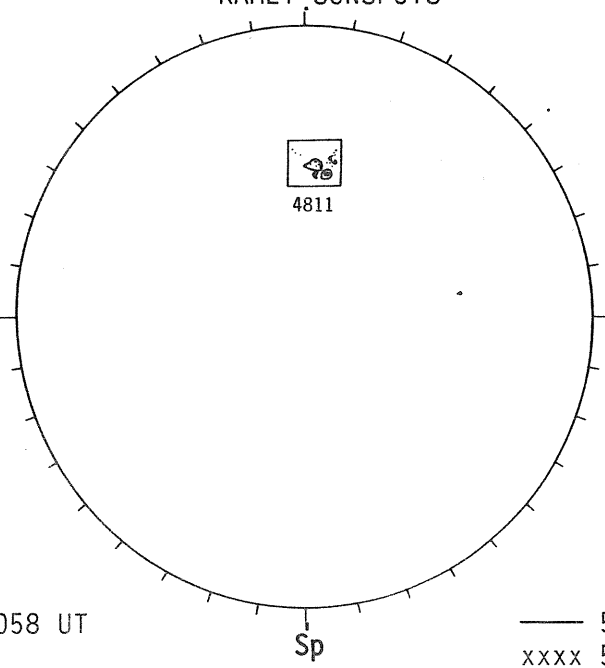


SACRAMENTO PEAK H-ALPHA



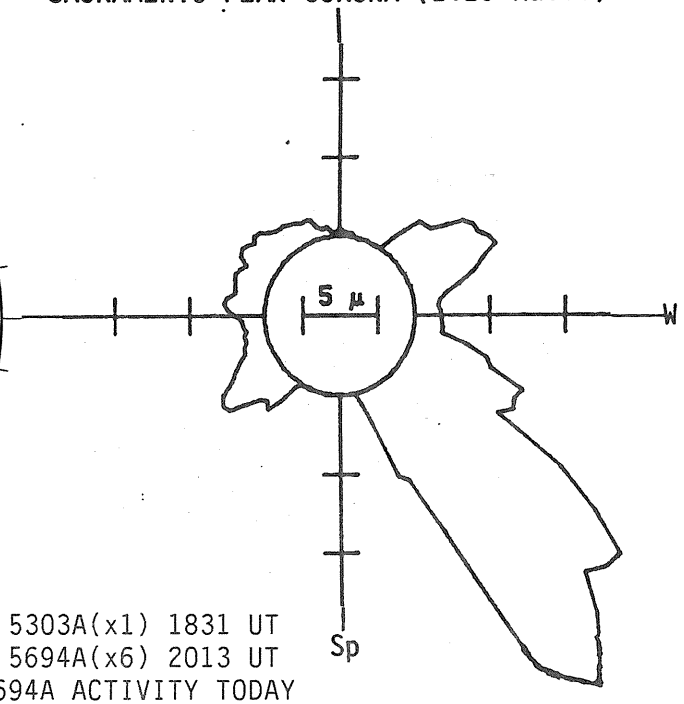
1540 UT

RAMEY SUNSPOTS



2058 UT

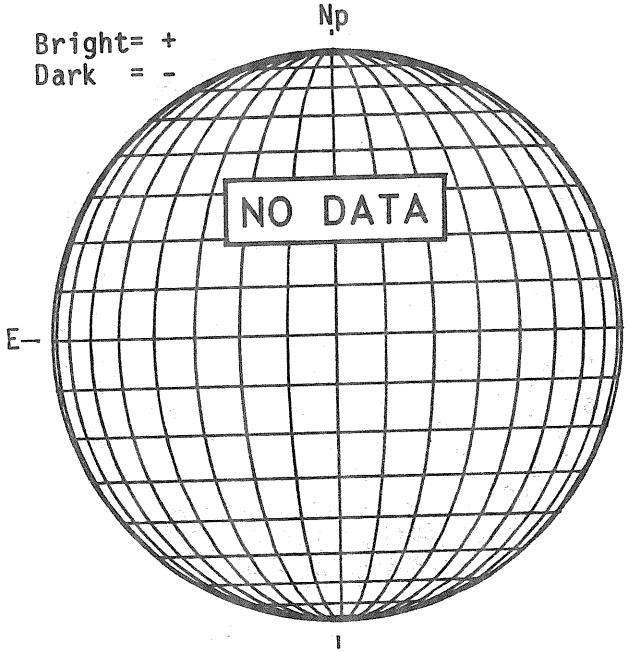
SACRAMENTO PEAK CORONA (1.15 Radii)



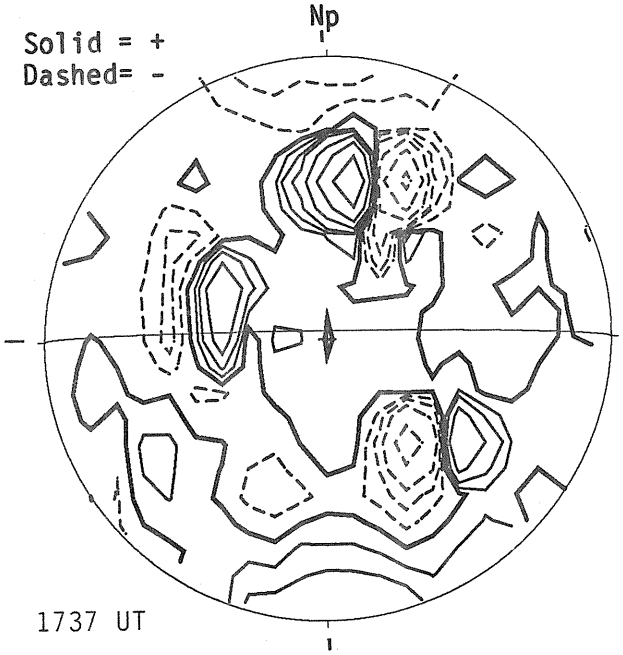
—— 5303A(x1) 1831 UT
xxxx 5694A(x6) 2013 UT
NO 5694A ACTIVITY TODAY

M A Y 22, 1 9 8 7 (P=-18.98, B_0=-1.91, L_0= 336.68)

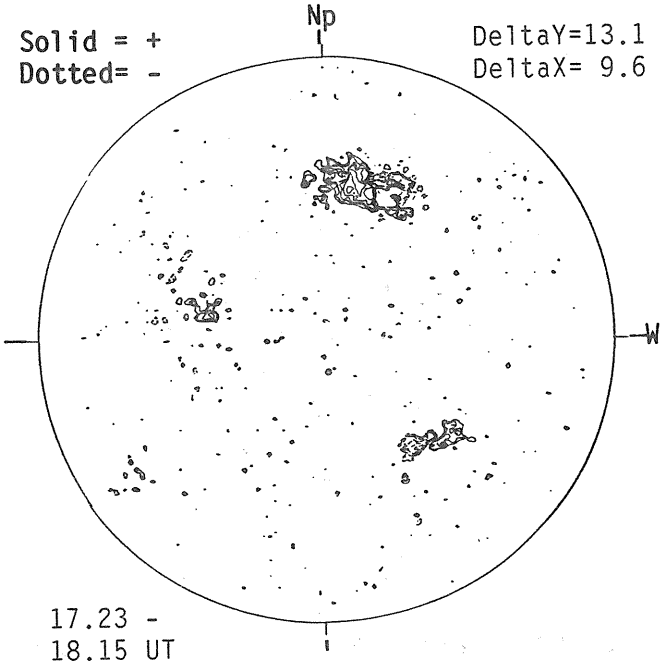
KITT PEAK MAGNETOGRAM



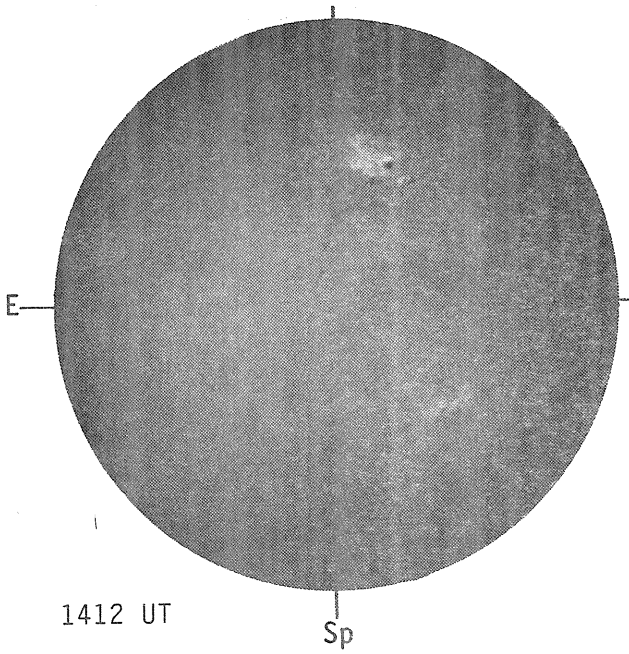
STANFORD MAGNETOGRAM



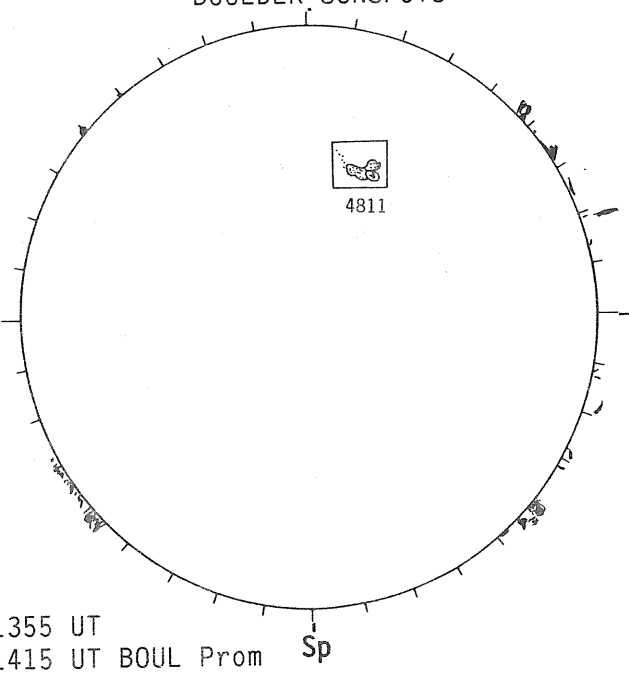
MT. WILSON MAGNETOGRAM



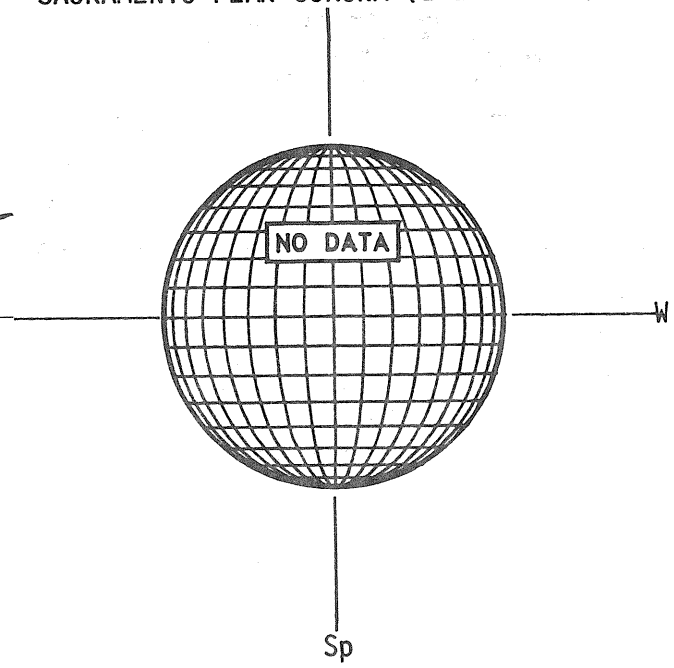
SACRAMENTO PEAK H-ALPHA



BOULDER SUNSPOTS



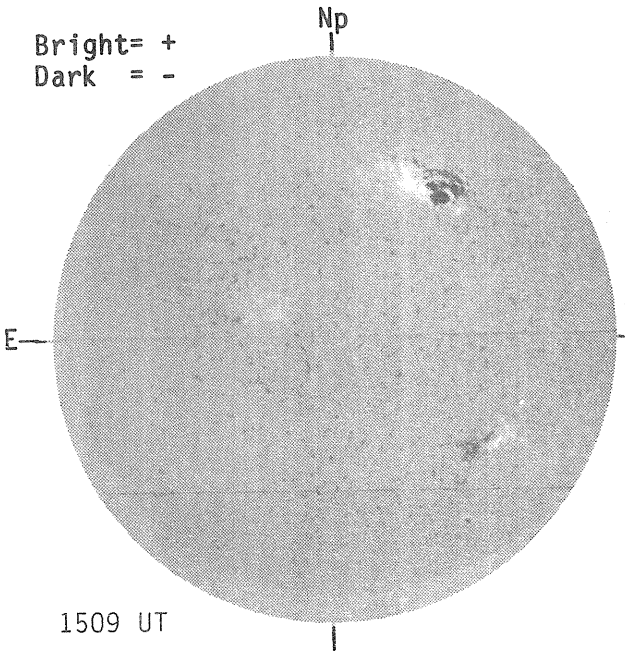
SACRAMENTO PEAK CORONA (1.15 Radii)



M A Y 23, 1 9 8 7 (P=-18.66, B_0=-1.79, L_0= 323.45)

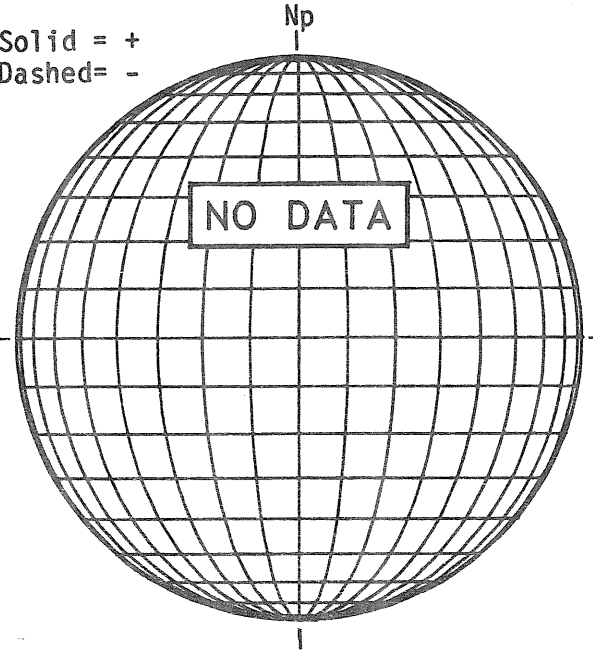
KITT PEAK MAGNETOGRAM

Bright= +
Dark = -



STANFORD MAGNETOGRAM

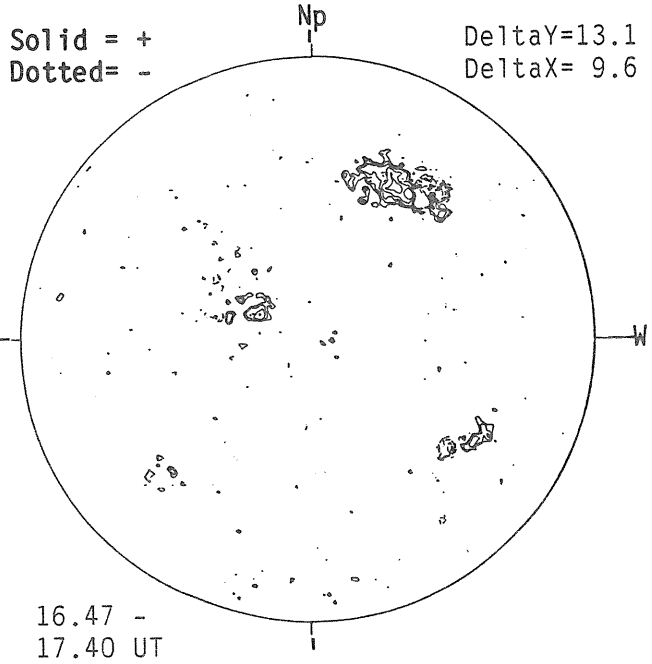
Solid = +
Dashed= -



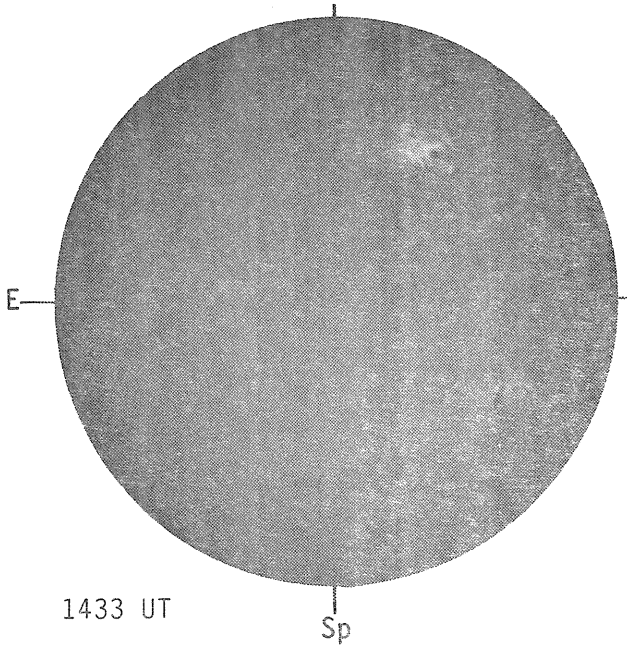
MT. WILSON MAGNETOGRAM

Solid = +
Dotted= -

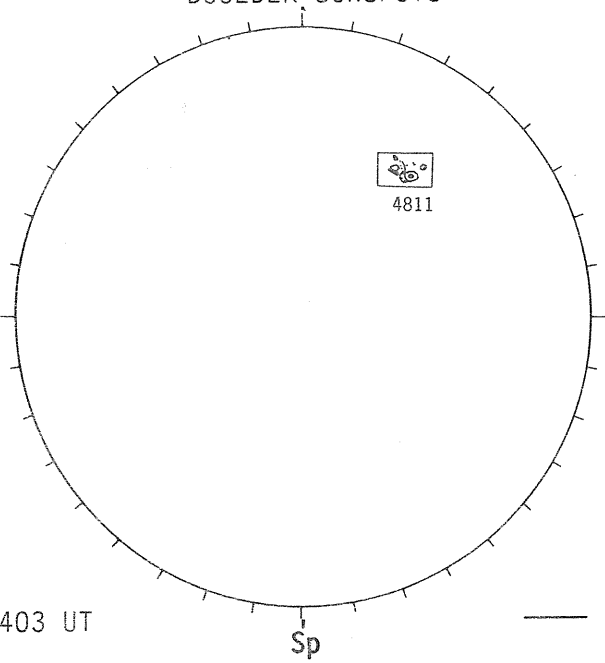
DeltaY=13.1
DeltaX= 9.6



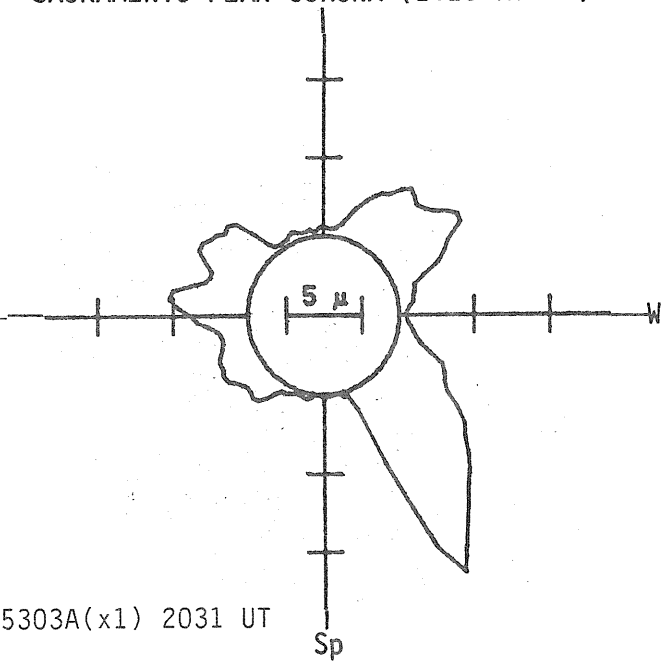
SACRAMENTO PEAK H-ALPHA



BOULDER SUNSPOTS



SACRAMENTO PEAK CORONA (1.15 Radii)

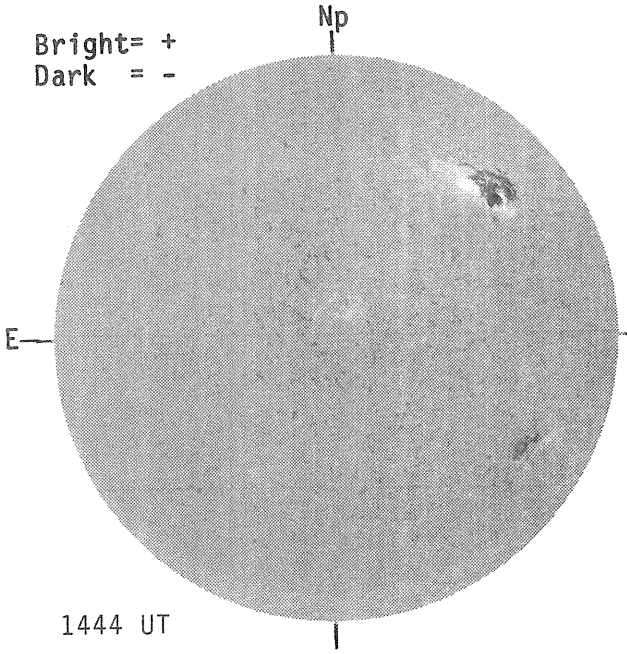


—— 5303A(x1) 2031 UT

M A Y 24, 1 9 8 7 (P=-18.34, B_0=-1.68, L_0= 310.22)

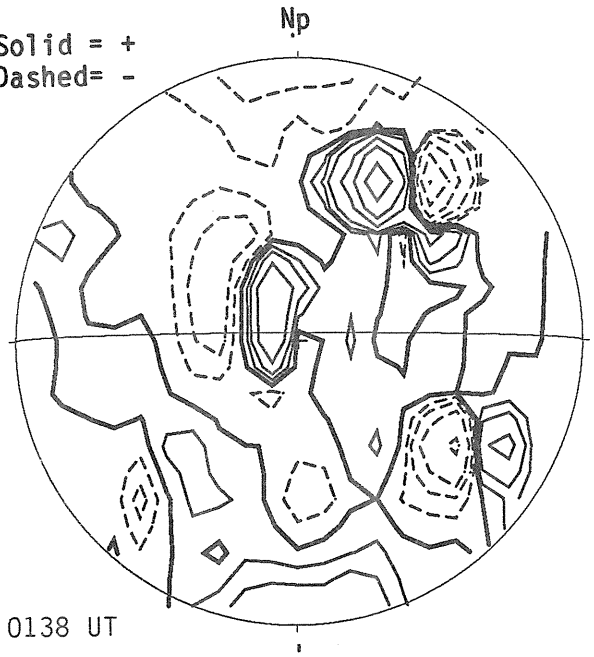
KITT PEAK MAGNETOGRAM

Bright= +
Dark = -



STANFORD MAGNETOGRAM

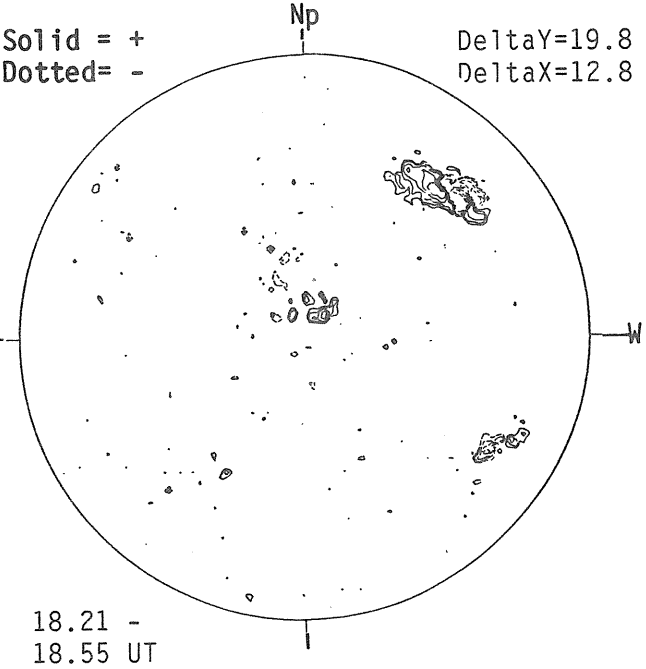
Solid = +
Dashed= -



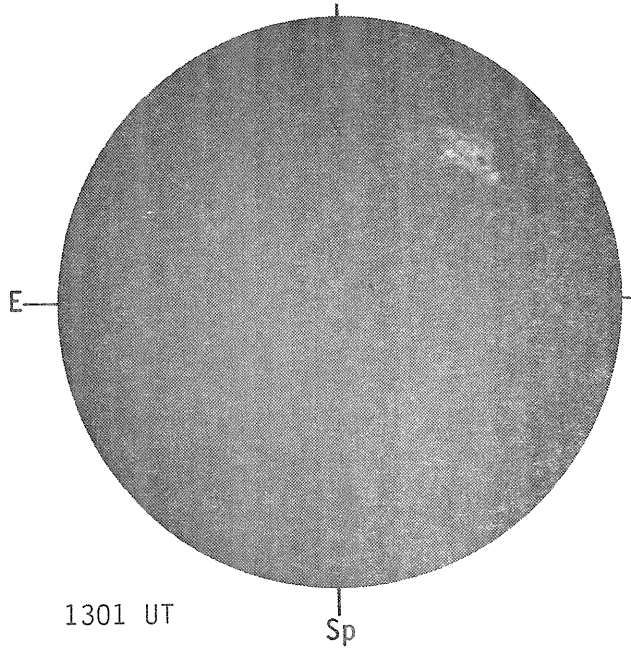
MT. WILSON MAGNETOGRAM

Solid = +
Dotted= -

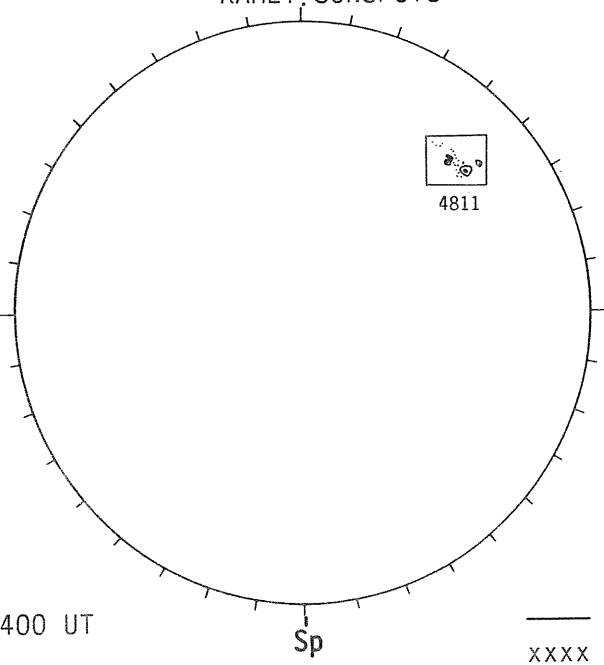
DeltaY=19.8
DeltaX=12.8



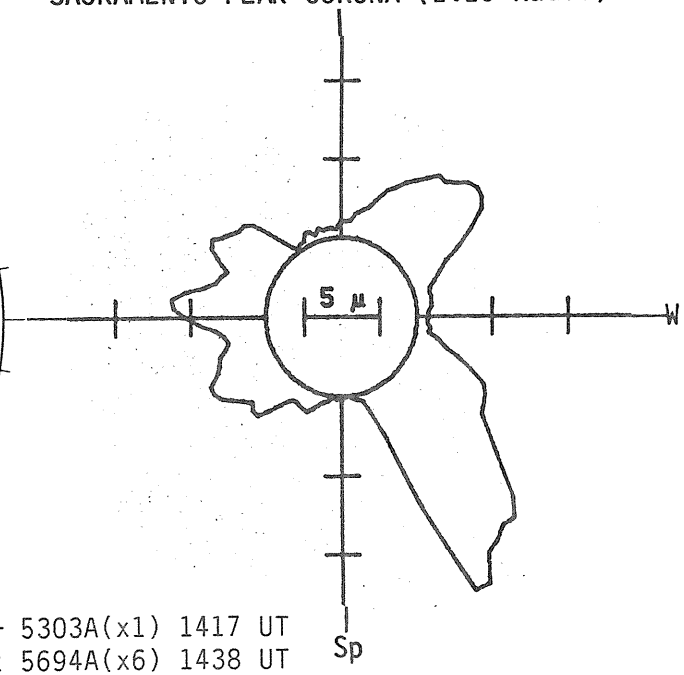
SACRAMENTO PEAK H-ALPHA



RAMEY SUNSPOTS



SACRAMENTO PEAK CORONA (1.15 Radii)

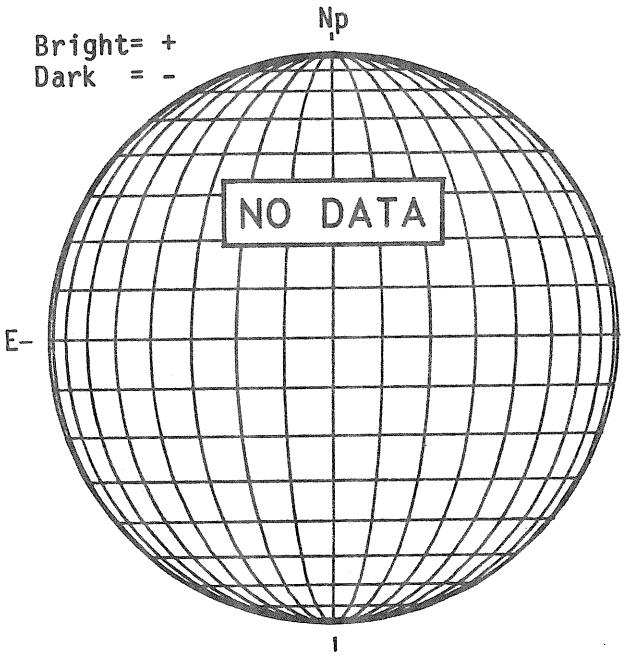


—— 5303A(x1) 1417 UT
xxxx 5694A(x6) 1438 UT
NO 5694A ACTIVITY TODAY

M A Y 25, 1 9 8 7 (P=-18.01, B_0=-1.56, L_0= 296.99)

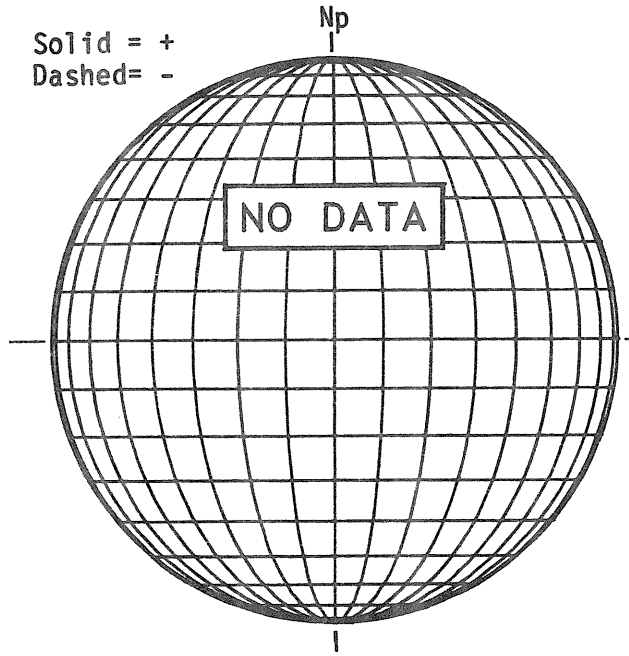
KITT PEAK MAGNETOGRAM

Bright= +
Dark = -



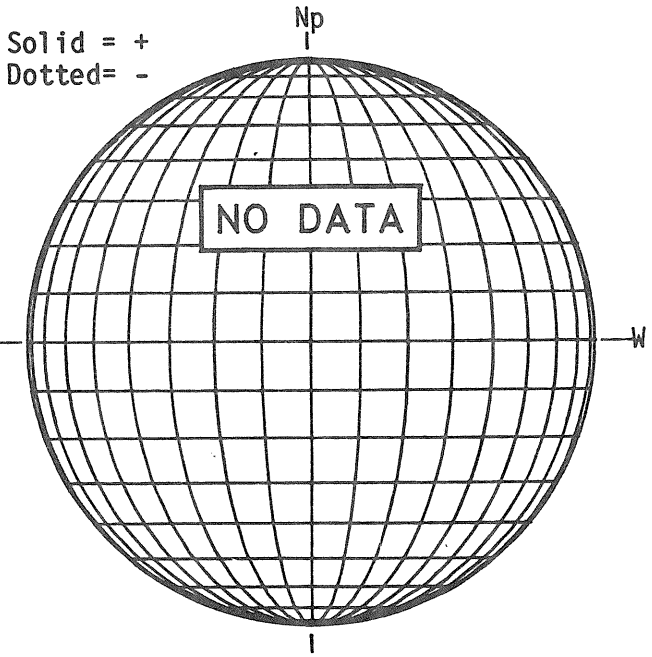
STANFORD MAGNETOGRAM

Solid = +
Dashed= -

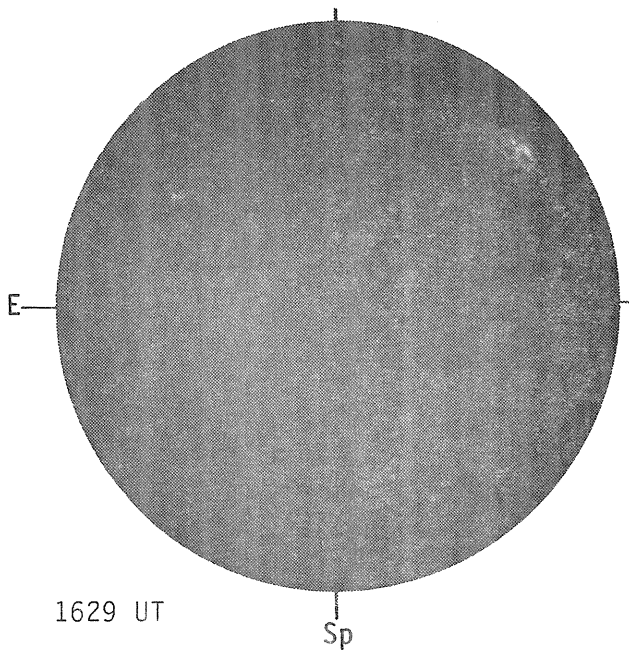


MT. WILSON MAGNETOGRAM

Solid = +
Dotted= -

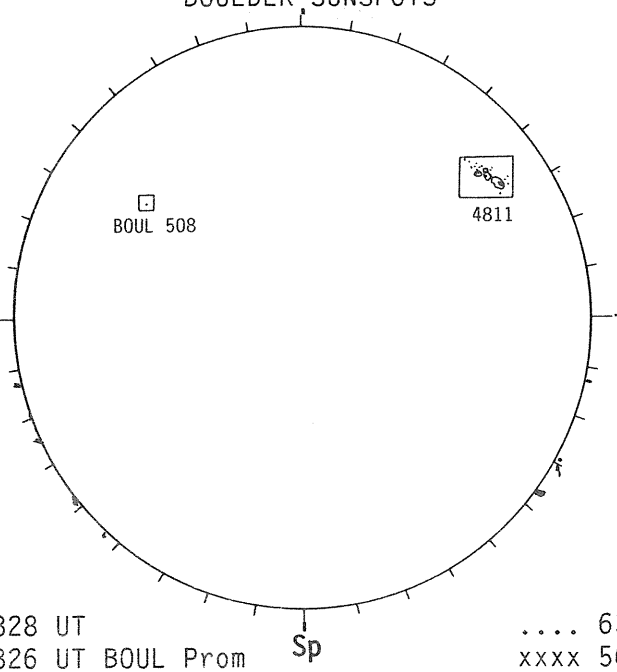


SACRAMENTO PEAK H-ALPHA



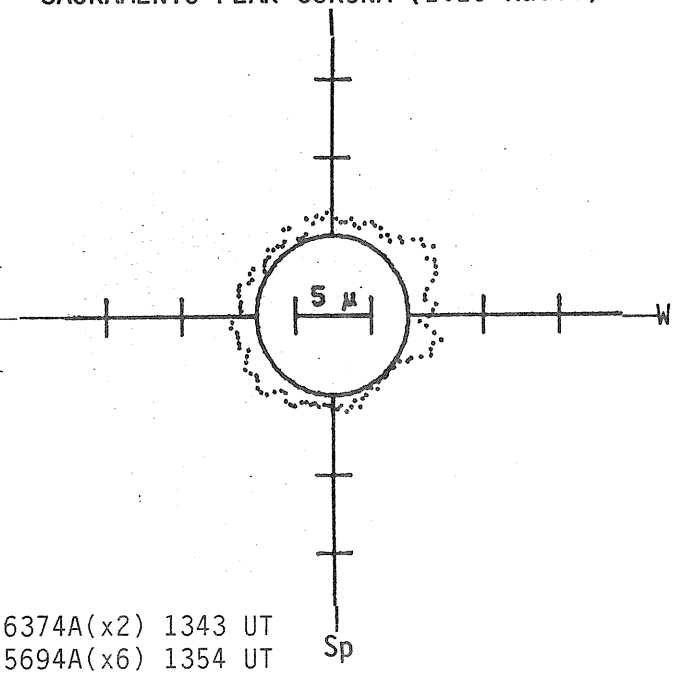
1629 UT

BOULDER SUNSPOTS



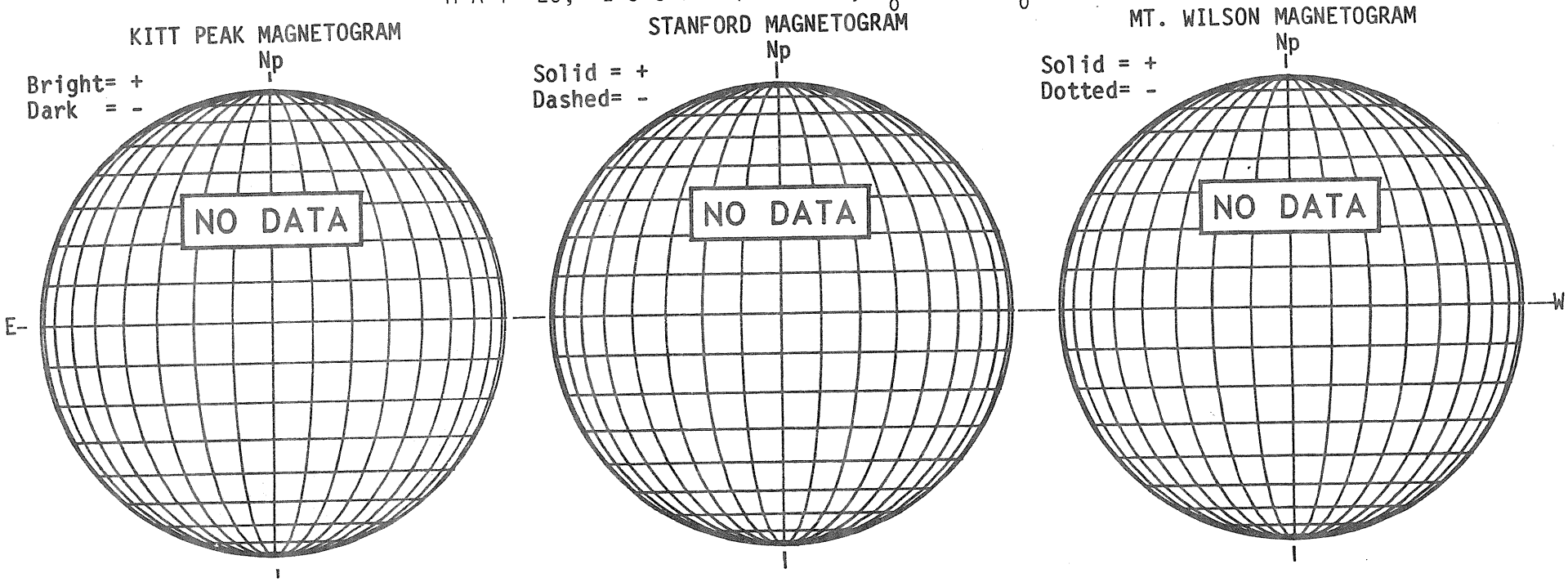
1328 UT
1326 UT BOUL Prom

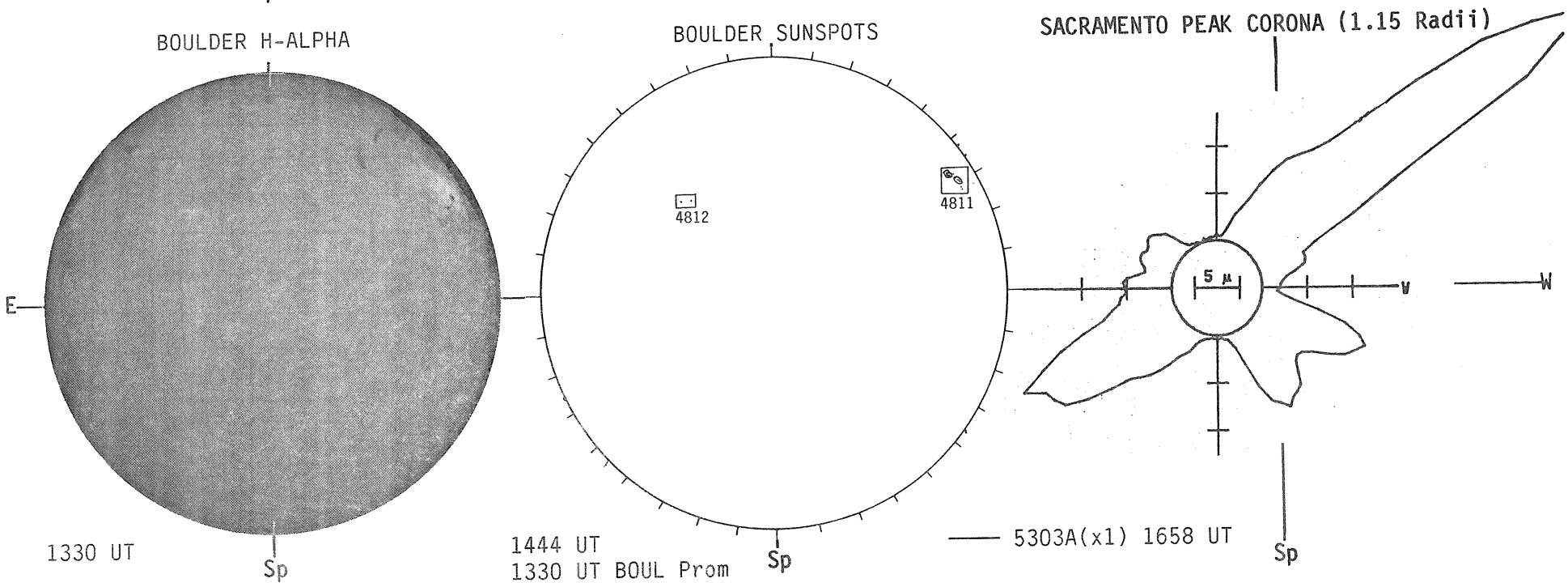
SACRAMENTO PEAK CORONA (1.15 Radii)



.... 6374A(x2) 1343 UT
xxxx 5694A(x6) 1354 UT
NO 5694A ACTIVITY TODAY

M A Y 26, 1 9 8 7 (P=-17.67, B_0=-1.44, L_0= 283.76)

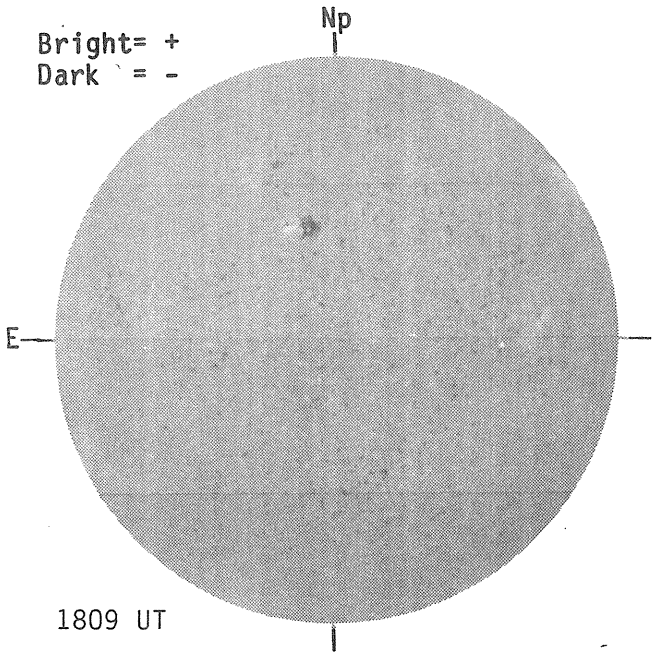




M A Y 27, 1 9 8 7 (P=-17.33, B_0=-1.33, L_0= 270.53)

KITT PEAK MAGNETOGRAM

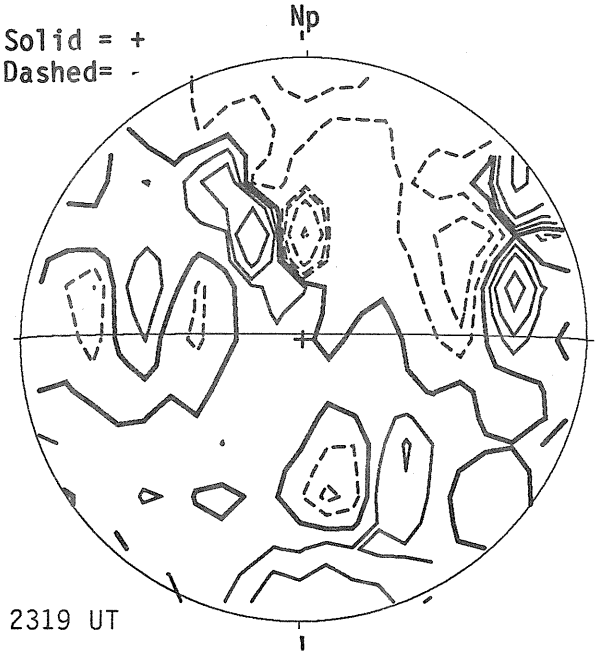
Bright= +
Dark = -



1809 UT

STANFORD MAGNETOGRAM

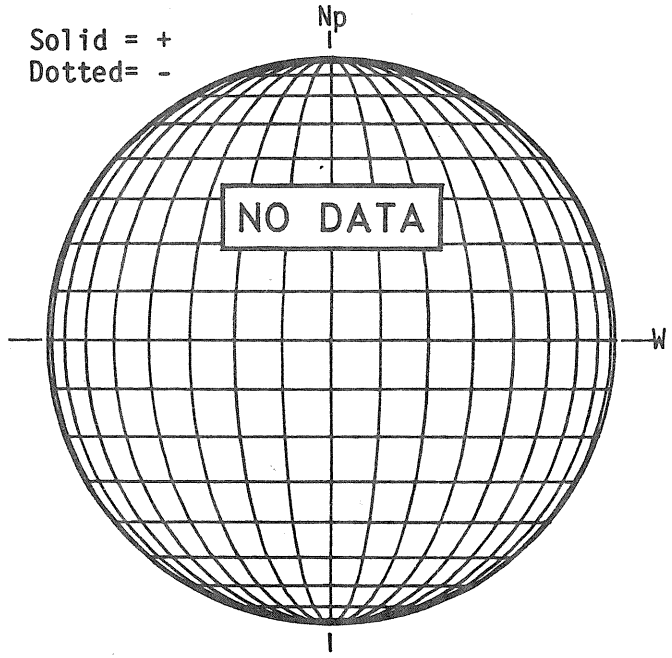
Solid = +
Dashed= -



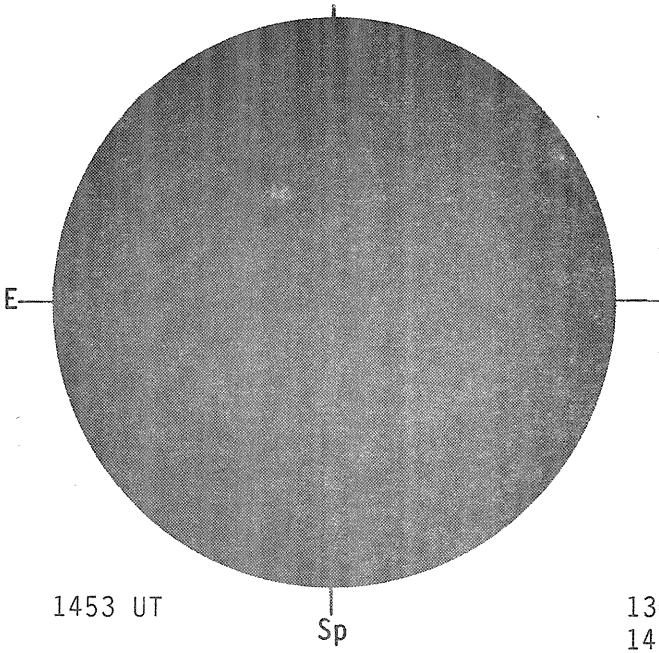
2319 UT

MT. WILSON MAGNETOGRAM

Solid = +
Dotted= -

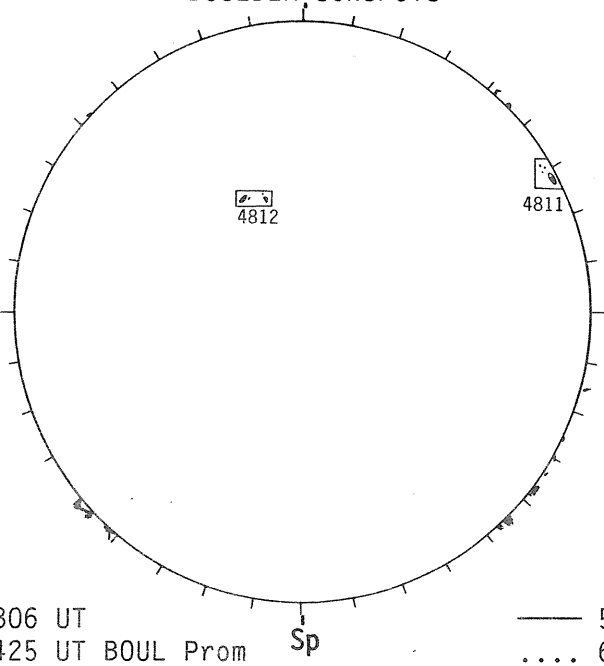


SACRAMENTO PEAK H-ALPHA



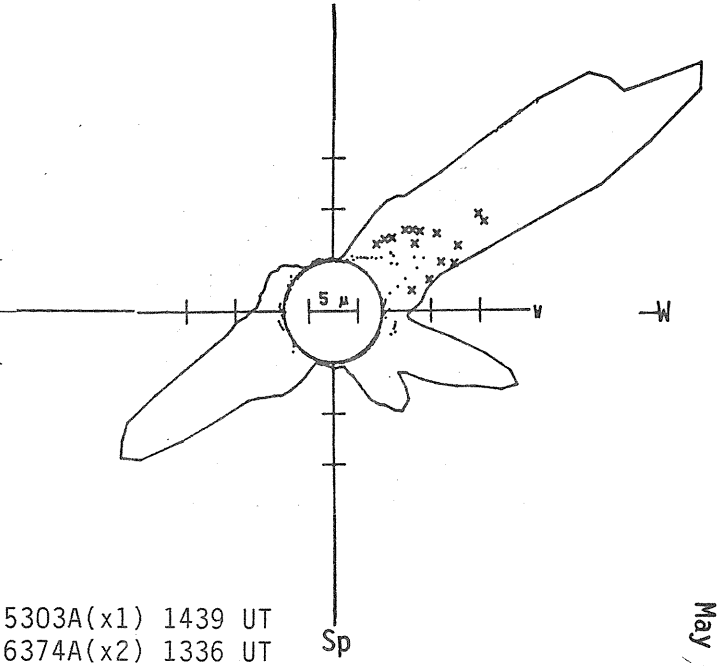
1453 UT

BOULDER SUNSPOTS



1306 UT
1425 UT BOUL Prom

SACRAMENTO PEAK CORONA (1.15 Radii)

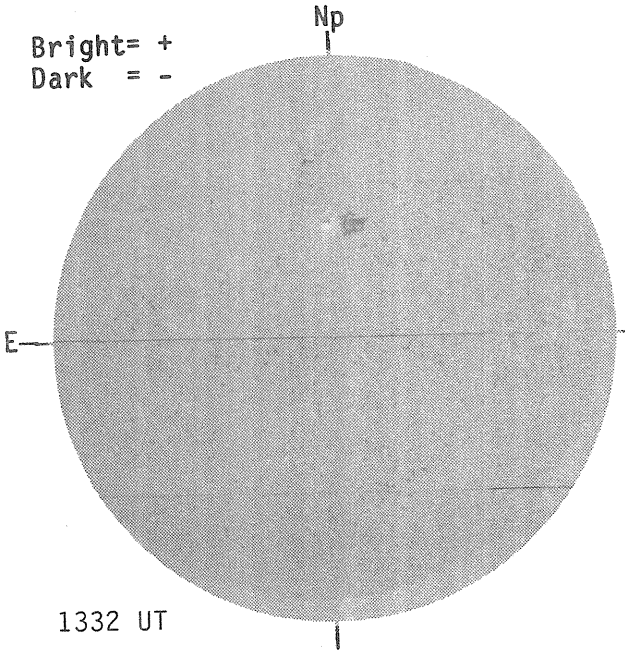


—— 5303A(x1) 1439 UT
.... 6374A(x2) 1336 UT
xxxx 5694A(x6) 1347 UT

M A Y 28, 1 9 8 7 (P=-16.98, B_o=-1.21, L_o= 257.30)

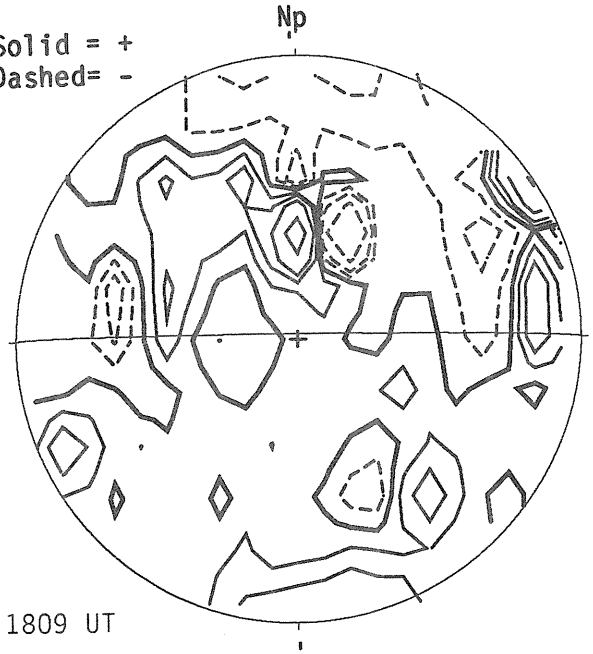
KITT PEAK MAGNETOGRAM

Bright= +
Dark = -



STANFORD MAGNETOGRAM

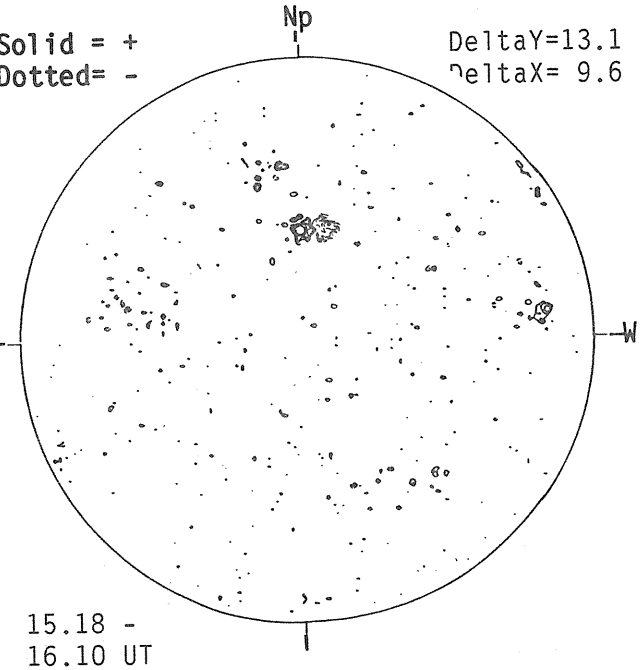
Solid = +
Dashed= -



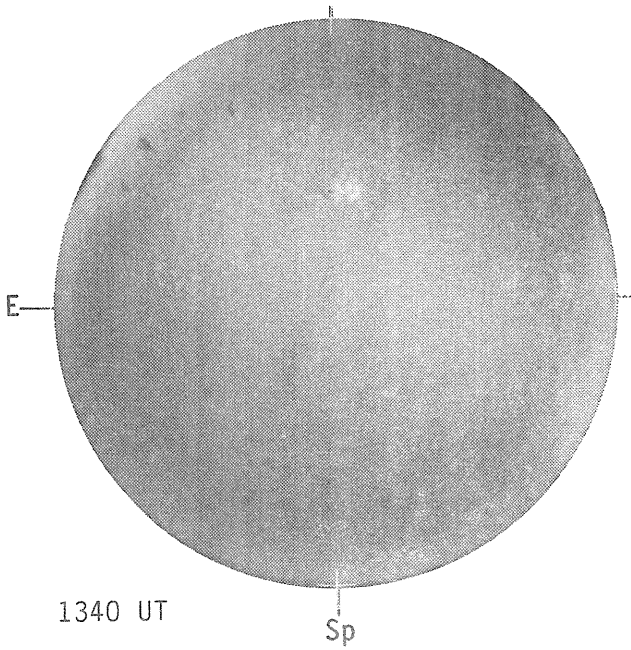
MT. WILSON MAGNETOGRAM

Solid = +
Dotted= -

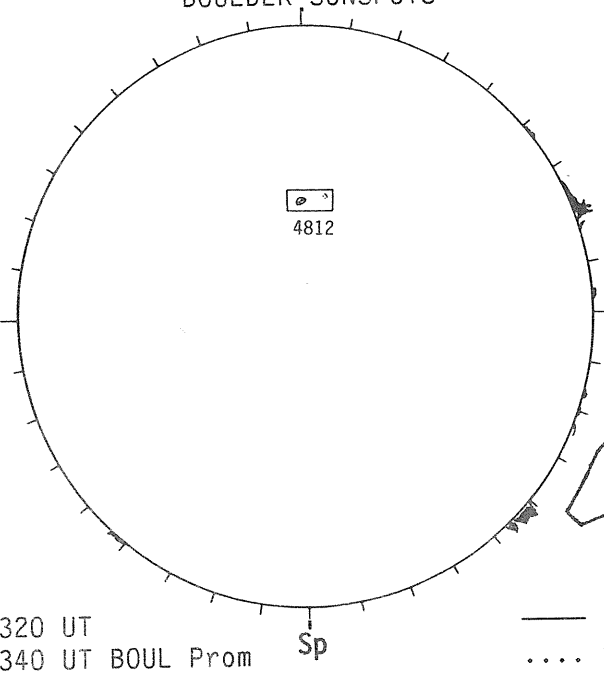
DeltaY=13.1
DeltaX= 9.6



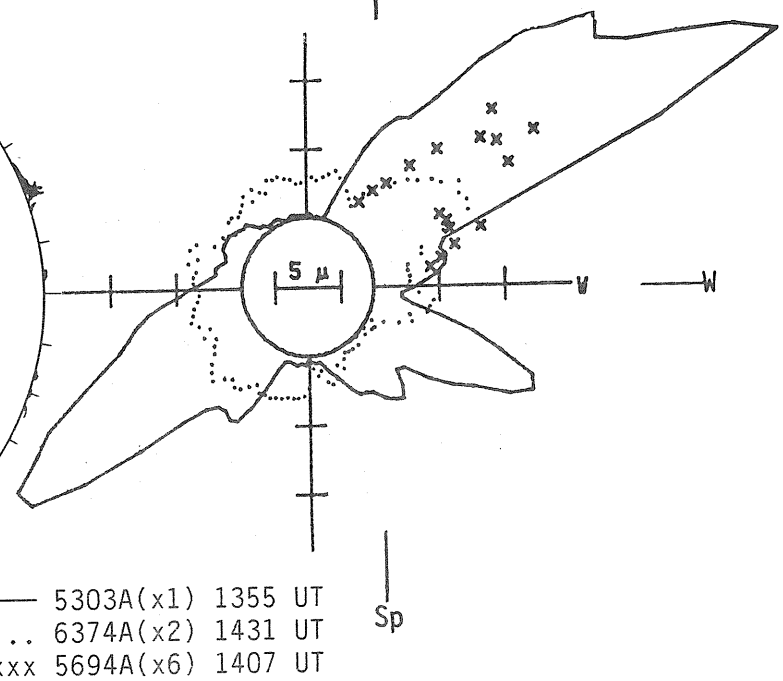
BOULDER H-ALPHA



BOULDER SUNSPOTS



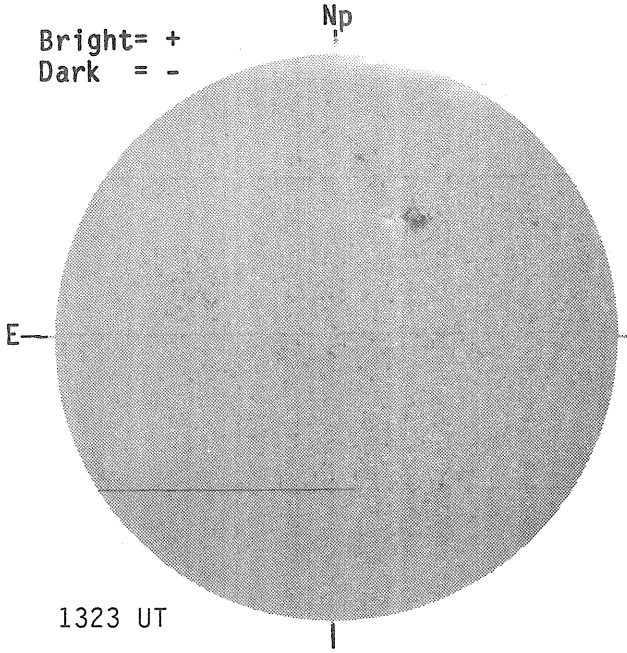
SACRAMENTO PEAK CORONA (1.15 Radii)



M A Y 29, 1 9 8 7 (P=-16.63, B_0=-1.09, L_0= 244.07)

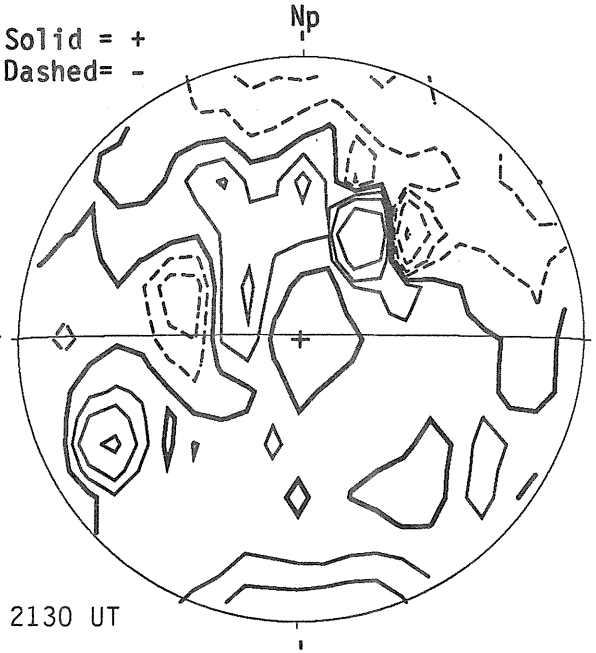
KITT PEAK MAGNETOGRAM

Bright= +
Dark = -



STANFORD MAGNETOGRAM

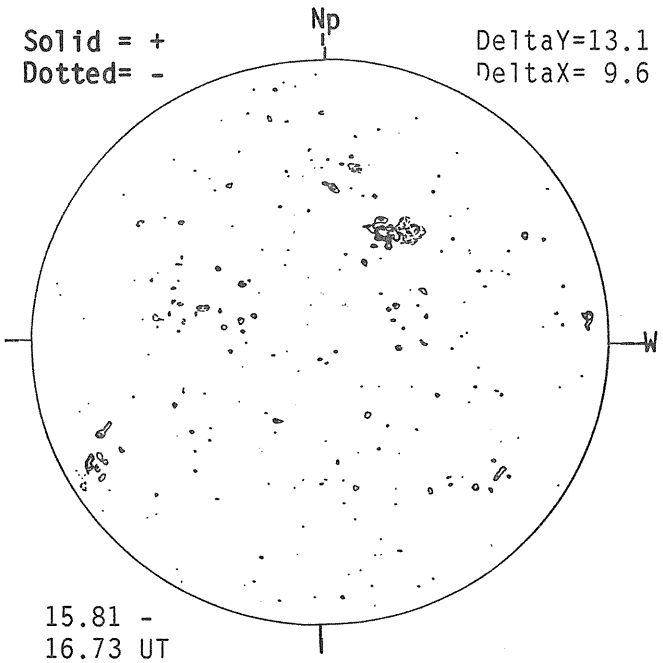
Solid = +
Dashed= -



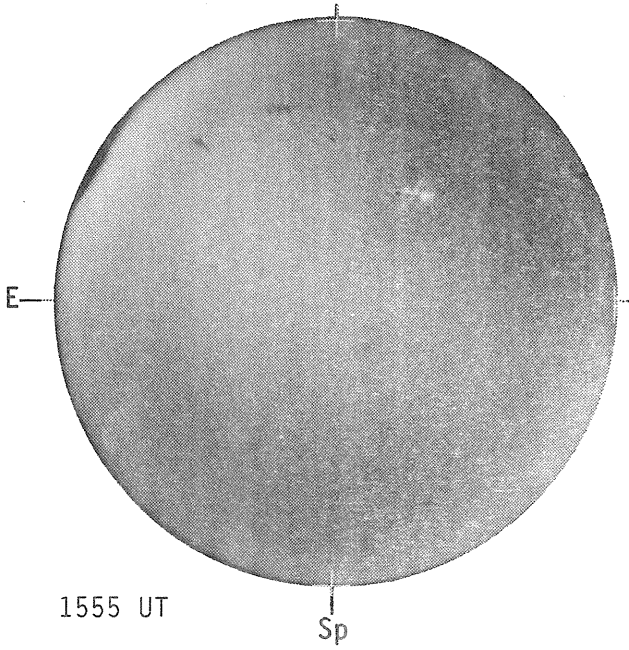
MT. WILSON MAGNETOGRAM

Solid = +
Dotted= -

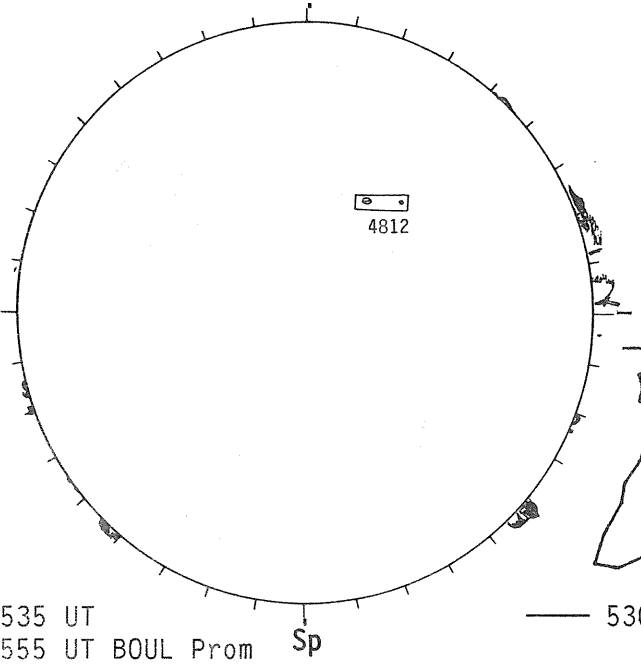
DeltaY=13.1
DeltaX= 9.6



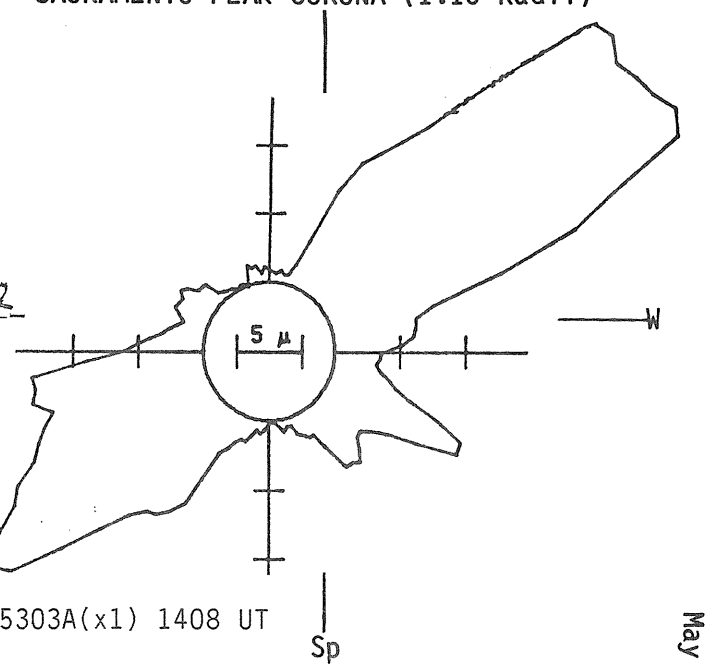
BOULDER H-ALPHA



BOULDER SUNSPOTS



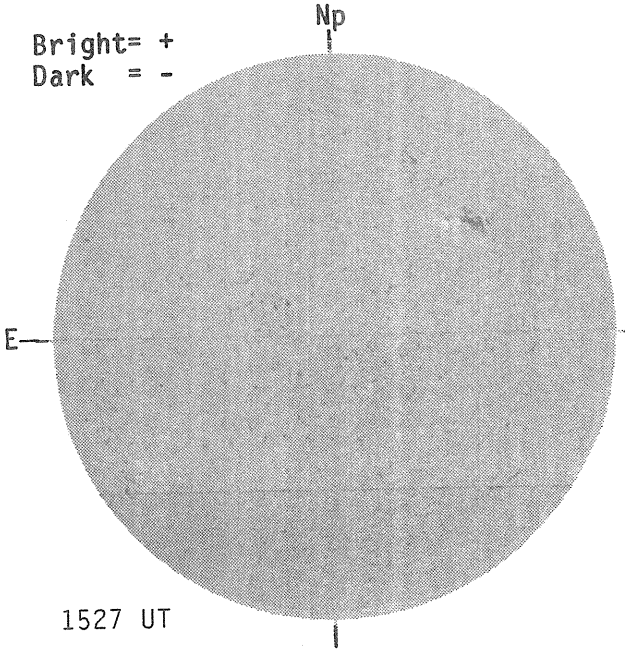
SACRAMENTO PEAK CORONA (1.15 Radii)



M A Y 30, 1 9 8 7 (P=-16.27, B_0=-0.97, L_0= 230.84)

KITT PEAK MAGNETOGRAM

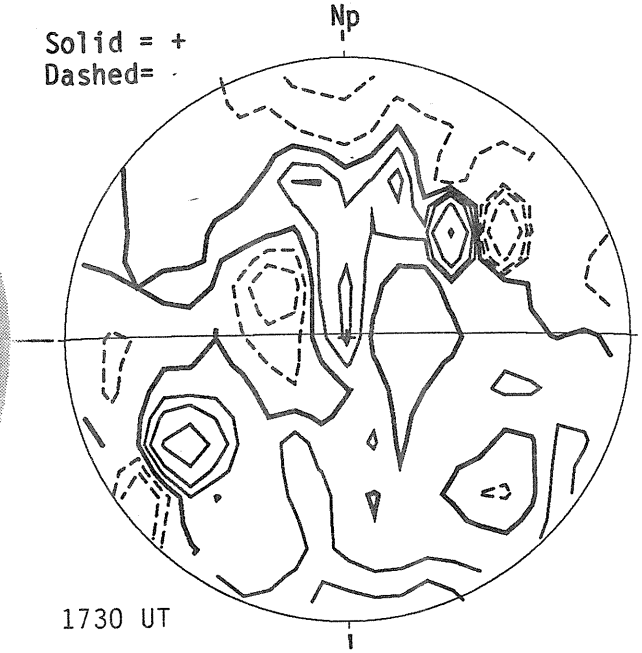
Bright= +
Dark = -



1527 UT

STANFORD MAGNETOGRAM

Solid = +
Dashed= -

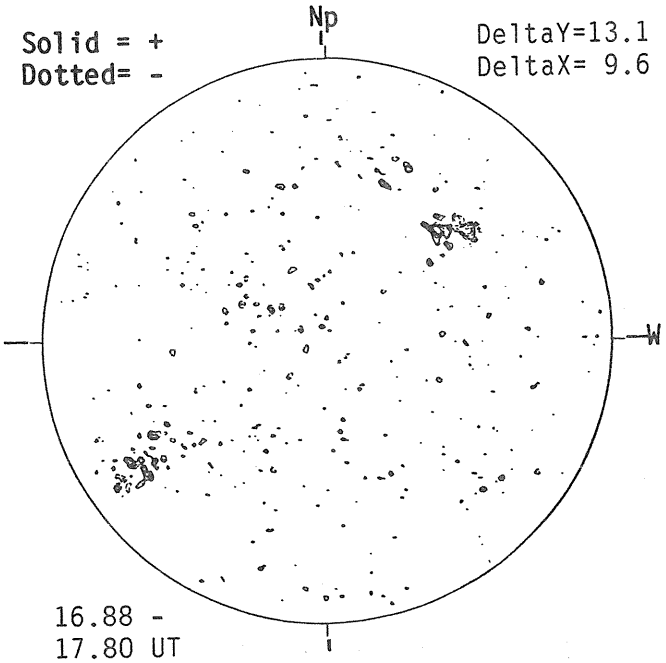


1730 UT

MT. WILSON MAGNETOGRAM

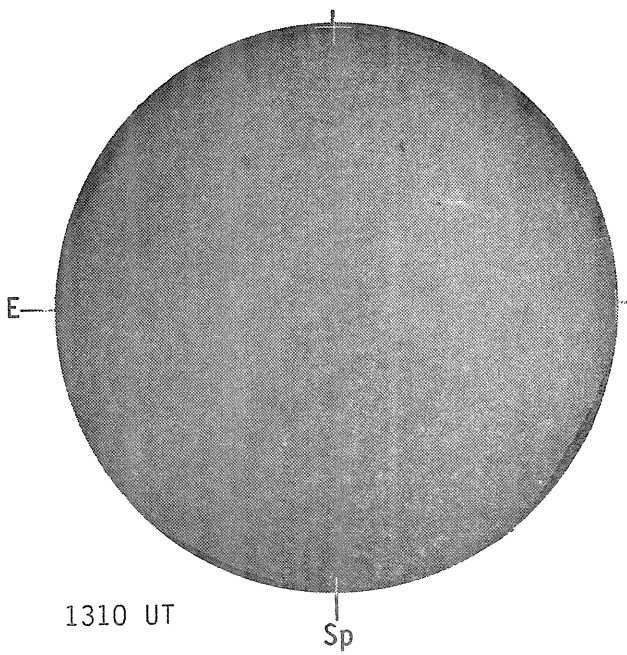
Solid = +
Dotted= -

DeltaY=13.1
DeltaX= 9.6



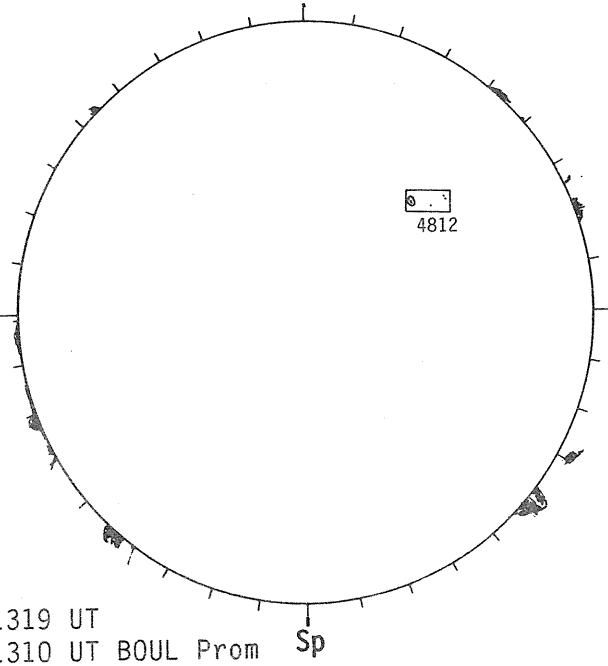
16.88 -
17.80 UT

BOULDER H-ALPHA



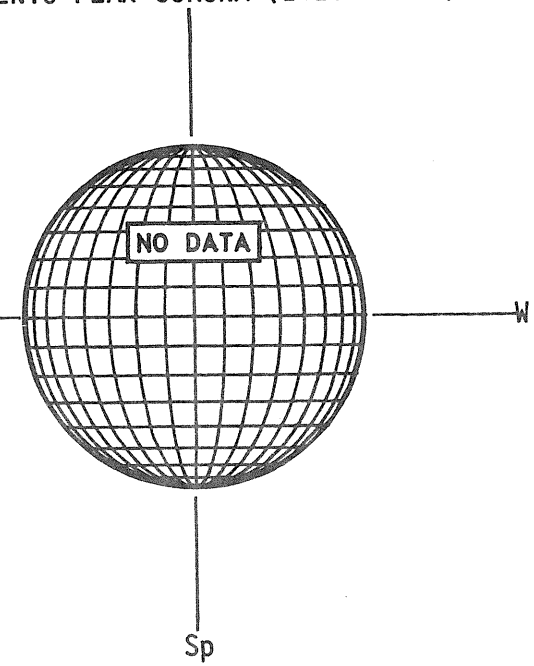
1310 UT

BOULDER SUNSPOTS



1319 UT
1310 UT BOUL Prom

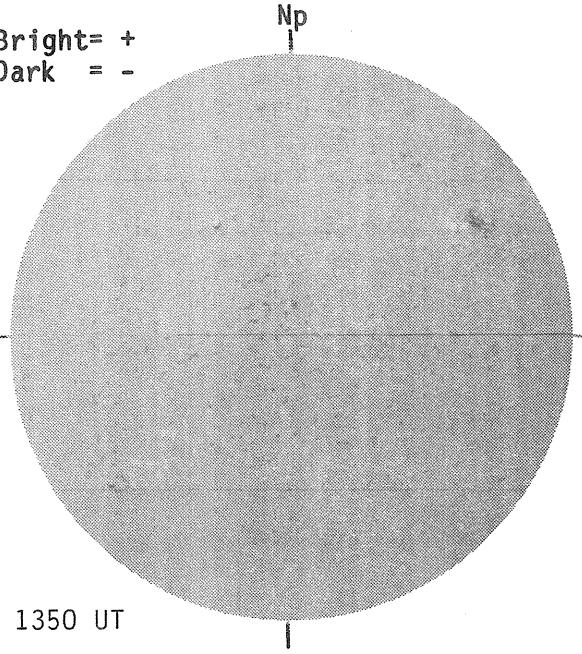
SACRAMENTO PEAK CORONA (1.15 Radii)



M A Y 31, 1 9 8 7 (P=-15.91, B_0=-0.85, L_0= 217.61)

KITT PEAK MAGNETOGRAM

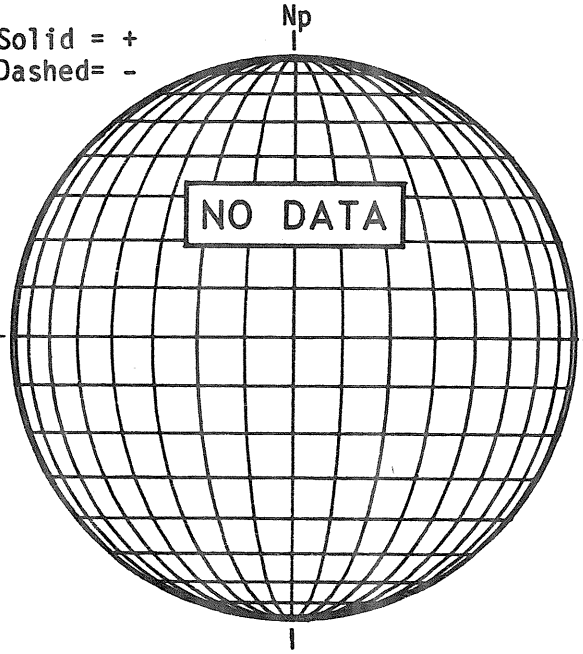
Bright= +
Dark = -



1350 UT

STANFORD MAGNETOGRAM

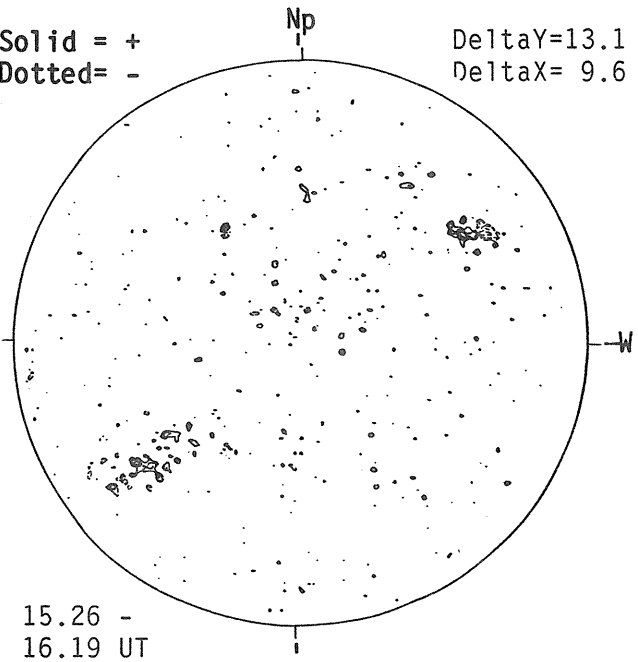
Solid = +
Dashed= -



MT. WILSON MAGNETOGRAM

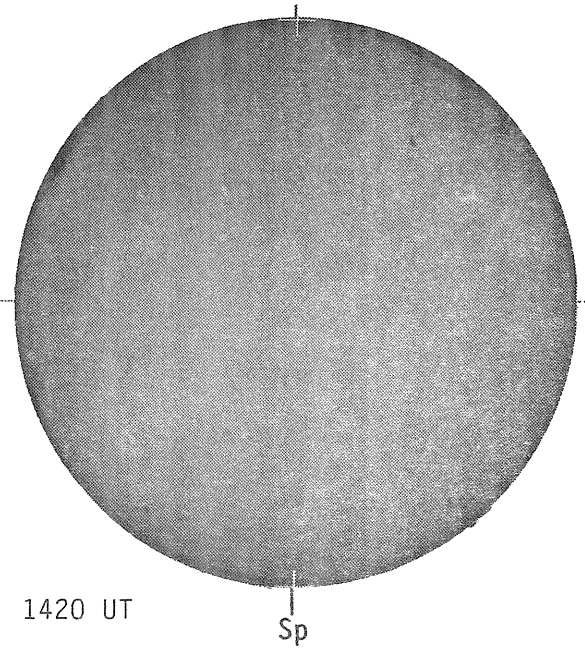
Solid = +
Dotted= -

DeltaY=13.1
DeltaX= 9.6



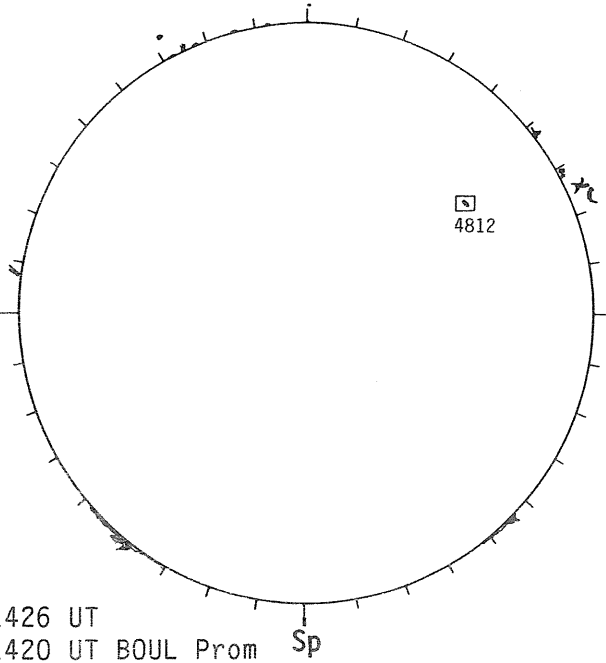
15.26 -
16.19 UT

BOULDER H-ALPHA



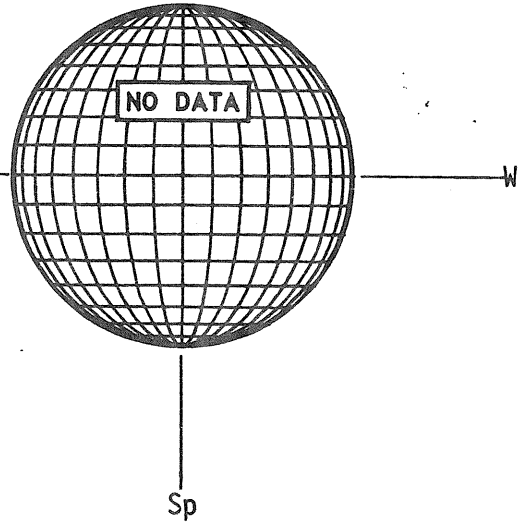
1420 UT

BOULDER SUNSPOTS



1426 UT
1420 UT BOUL Prom

SACRAMENTO PEAK CORONA (1.15 Radii)



S U N S P O T G R O U P S
(ORDERED BY CENTRAL MERIDIAN PASSAGE DATE)

MAY 1987

NOAA/ USAF Group	Mt Wilson Group	Sta	Observation Mo	Day	Time (UT)	Lat	CMD	CMP Mo	Day	Max H	Mag Class	Spot Class	Corrected Area (10-6 Hemi)	Spot Count	Long. Extent (Deg)	Qual
4803A	24388	MWIL	04	28	1410	N26	E36	05	1.4	3	(B)					
4803A		HOLL	04	28	1547	N26	E36	05	1.4		A	AX		1		3
4805	24391	MWIL	05	01	1425	N06	E42	05	4.7	3	(AF)					
4805		HOLL	05	02	1455	N05	E23	05	4.3		A	AX	10	3	2	3
4805	24391	MWIL	05	02	1600	N05	E23	05	4.4	3	(B)					
4805		PALE	05	02	1730	N05	E22	05	4.4		B	BXO	10	3	3	3
4805		SVTO	05	03	0830	N06	E13	05	4.3		B	BXO	10	2	3	3
4805	24391	MWIL	05	03	1400	N05	E08	05	4.2	3	(AP)					
4805		RAMY	05	03	1525	N06	E08	05	4.2		B	BXO	10	2	1	2
4805		HOLL	05	03	1528	N06	E08	05	4.2		A	AX	10	2		3
4805		PALE	05	03	1745	N05	E06	05	4.2		A	AX	10	1		3
4804		SVTO	04	30	0610	S22	E81	05	6.5		A	HS	30	1	2	3
4804		RAMY	04	30	1357	S22	E79	05	6.6		A	HX	20	1	2	4
4804		HOLL	04	30	1505	S24	E80	05	6.8		A	HS	30	1	1	4
4804	24390	MWIL	04	30	1845	S24	E76	05	6.7	3	(AP)					
4804		PALE	04	30	1915	S24	E77	05	6.7		B	HA	60	1	2	2
4804		LEAR	05	01	0228	S23	E73	05	6.7		A	HS	20	1	1	3
4804		BOUL	05	01	1340	S23	E66	05	6.6		A	HS	40	1	1	3
4804		RAMY	05	01	1355	S23	E67	05	6.7		A	HS	20	1	3	3
4804	24390	MWIL	05	01	1425	S24	E67	05	6.8	4	(AP)					
4804		HOLL	05	01	1554	S23	E67	05	6.8		A	HS	60	1	1	3
4804		PALE	05	01	2330	S23	E63	05	6.8		A	HS	60	1	1	3
4804		LEAR	05	02	0050	S24	E65	05	7.0		B	CSO	20	2	8	3
4804		SVTO	05	02	0758	S22	E58	05	6.8		A	HS	80	1	2	3
4804		BOUL	05	02	1400	S23	E52	05	6.6		A	HS	40	1	1	3
4804		RAMY	05	02	1415	S22	E55	05	6.8		A	HS	30	1	3	3
4804		HOLL	05	02	1455	S23	E54	05	6.8		A	HS	30	1	1	3
4804	24390	MWIL	05	02	1600	S24	E53	05	6.8	5	(AP)					
4804		PALE	05	02	1730	S23	E53	05	6.8		A	HS	30	1	1	3
4804		CULG	05	03	0445	S23	E47	05	6.8		A	HS	40	1	1	2
4804		SVTO	05	03	0830	S23	E45	05	6.8		A	HS	80	1	2	3
4804	24390	MWIL	05	03	1400	S24	E42	05	6.8	5	(AP)					
4804		RAMY	05	03	1525	S22	E41	05	6.8		A	HS	60	1	2	2
4804		HOLL	05	03	1528	S22	E41	05	6.8		A	HS	60	1	2	3
4804		PALE	05	03	1745	S24	E40	05	6.8		A	HS	50	1	2	3
4804		SVTO	05	04	0700	S23	E33	05	6.8		A	HS	50	1	2	2
4804		RAMY	05	04	1330	S23	E28	05	6.7		A	HS	70	1	2	4
4804	24390	MWIL	05	04	1415	S24	E28	05	6.8	5	(AP)					
4804		HOLL	05	04	1625	S23	E27	05	6.8		A	HS	40	1	1	3
4804		PALE	05	04	1740	S24	E26	05	6.7		A	HS	50	1	2	4
4804		LEAR	05	05	0115	S22	E20	05	6.6		A	HS	30	1	1	2
4804		CULG	05	05	0500	S23	E20	05	6.7		A	HS	40	1	1	3
4804		SVTO	05	05	0800	S23	E16	05	6.6		B	CAO	70	2	4	3
4804	24390	MWIL	05	05	1410	S24	E16	05	6.8	5	(AP)					
4804		RAMY	05	05	1412	S23	E15	05	6.7		A	HS	40	1	1	3
4804		HOLL	05	05	1635	S23	E14	05	6.8		A	HS	40	1	2	4
4804		PALE	05	05	1930	S23	E13	05	6.8		A	HS	30	1	2	2
4804		CULG	05	06	0435	S22	E08	05	6.8		A	HS	30	1	1	3
4804		LEAR	05	06	0628	S24	E06	05	6.7		A	HS	40	1	1	4
4804		SVTO	05	06	1253	S23	E04	05	6.8		A	HA	40	1	2	1
4804		RAMY	05	06	1334	S23	E03	05	6.8		A	HS	40	1	1	3
4804	24390	MWIL	05	06	1420	S24	E02	05	6.8	4	(AP)					
4804		BOUL	05	06	1550	S22	E02	05	6.8		A	AX	30	1	1	3
4804		HOLL	05	06	1610	S23	E01	05	6.7		A	HS	40	1	1	4
4804		PALE	05	06	1806	S23	W01	05	6.7		A	HS	30	1	2	3
4804		LEAR	05	07	0018	S25	W03	05	6.8		A	HS	20	3	3	4
4804		CULG	05	07	0450	S22	W07	05	6.7		A	HS	20	1	1	3
4804		SVTO	05	07	0725	S23	W08	05	6.7		A	HA	40	2	2	2
4804		RAMY	05	07	1315	S23	W11	05	6.7		A	HR	20	1	2	3
4804		BOUL	05	07	1345	S23	W11	05	6.7		A	HA	20	2	1	4
4804	24390	MWIL	05	07	1410	S24	W11	05	6.7	4	(AP)					
4804		HOLL	05	07	1509	S24	W11	05	6.8		A	HA	20	2	2	3
4804		PALE	05	07	1817	S22	W12	05	6.8		A	HS	20	2	1	2
4804		LEAR	05	08	0019	S22	W16	05	6.8		A	AX	10	2	1	4
4804		CULG	05	08	0435	S22	W19	05	6.7		A	AX	10	1	1	3
4804		SVTO	05	08	0651	S22	W20	05	6.7		A	HR	10	2		3

S U N S P O T G R O U P S
(ORDERED BY CENTRAL MERIDIAN PASSAGE DATE)

MAY 1987

NOAA/ USAF Group	Mt Wilson Group	Sta	Observation Mo	Day	Time (UT)	Lat	CMD	CMP Mo	Day	Max H	Mag Class	Spot Class	Corrected Area (10-6 Hemi)	Spot Count	Long. Extent (Deg)	Qual
4804		RAMY	05	10	1245	S22	W47	05	6.9		A	AX	10	1	1	4
4807		RAMY	05	09	1245	S06	E10	05	10.3		A	AX	10	1	1	4
4807	24394	MWIL	05	09	1400	S06	E08	05	10.2	3	(AP)					
4807		HOLL	05	09	1450	S06	E09	05	10.3		A	AX	10	2		3
4807A		PALE	05	12	1733	S56	W26	05	10.5		B	BXO		2	3	3
4807A	24396	MWIL	05	12	1400	S56	W23	05	10.6	4	(B)					
4807A	24396	MWIL	05	14	1430	S55	W43	05	10.9	3	(B)					
4809		BOUL	05	12	1318	N26	W15	05	11.4		B	BXO	10	2	2	2
4809	24397	MWIL	05	12	1400	N26	W16	05	11.3	4	(BP)					
4809		HOLL	05	12	1500	N27	W17	05	11.3		B	BXO	10	3	3	3
4809		RAMY	05	12	1552	N28	W18	05	11.2		B	BXI	10	6	3	2
4809		PALE	05	12	1733	N26	W17	05	11.4		B	BXO	10	3	4	3
4809		CULG	05	13	0430	N27	W23	05	11.4		B	DRO	30	2	4	2
4809		SVTO	05	13	0840	N27	W26	05	11.3		B	BXO	10	3	3	3
4809		HOLL	05	13	1425	N27	W30	05	11.3		B	BXO	10	2	4	3
4809	24397	MWIL	05	13	1430	N27	W30	05	11.3	2	(BP)					
4809		PALE	05	13	2220	N29	W31	05	11.5		A	AX		1		3
4809	24397	MWIL	05	14	1430	N25	W43	05	11.3	3	(BP)					
4806		SVTO	05	04	0700	S32	E86	05	11.1		A	AX	120	1	3	2
4806		RAMY	05	04	1330	S33	E82	05	11.1		A	HS	140	1	3	4
4806	24392	MWIL	05	04	1415	S31	E86	05	11.4	3	B					
4806		HOLL	05	04	1625	S31	E85	05	11.4		B	DSO	140	4	10	3
4806		PALE	05	04	1740	S33	E80	05	11.1		B	DAO	100	2	7	4
4806		LEAR	05	05	0115	S32	E75	05	11.0		B	DSO	60	4	4	2
4806		CULG	05	05	0500	S32	E78	05	11.4		B	DSO	200	2	9	3
4806		SVTO	05	05	0800	S32	E78	05	11.5		B	DAO	160	2	6	3
4806	24393	MWIL	05	05	1410	S30	E75	05	11.5	4	(AP)					
4806	24392	MWIL	05	05	1410	S32	E69	05	11.1	5	(BP)					
4806		RAMY	05	05	1412	S32	E71	05	11.2		B	DHO	80	2	9	3
4806		HOLL	05	05	1635	S32	E71	05	11.3		B	DSO	130	5	8	4
4806		PALE	05	05	1930	S32	E71	05	11.4		B	DSO	210	2	10	2
4806		CULG	05	06	0435	S31	E63	05	11.2		B	DSO	170	5	10	3
4806		LEAR	05	06	0628	S33	E63	05	11.3		B	DSO	160	5	10	4
4806		SVTO	05	06	1253	S31	E60	05	11.3		B	DKO	120	4	10	1
4806		RAMY	05	06	1334	S32	E60	05	11.3		B	DHI	110	8	9	3
4806	24393	MWIL	05	06	1420	S31	E64	05	11.6	5	(B)					
4806	24392	MWIL	05	06	1420	S33	E58	05	11.2	5	(BP)					
4806		BOUL	05	06	1550	S32	E57	05	11.2		B	DSO	240	5	7	3
4806		HOLL	05	06	1610	S32	E58	05	11.3		B	DSO	210	9	8	4
4806		PALE	05	06	1806	S32	E58	05	11.3		B	ESO	220	10	13	3
4806		LEAR	05	07	0018	S32	E54	05	11.3		B	DSO	160	12	10	4
4806		CULG	05	07	0450	S31	E50	05	11.1		B	ESO	160	8	13	3
4806		SVTO	05	07	0725	S31	E48	05	11.1		B	DAO	270	13	10	2
4806		RAMY	05	07	1315	S32	E46	05	11.2		B	EHI	160	17	11	3
4806		BOUL	05	07	1345	S32	E45	05	11.1		B	DHO	340	11	9	4
4806	24393	MWIL	05	07	1410	S31	E50	05	11.5	5	(BF)					
4806	24392	MWIL	05	07	1410	S33	E44	05	11.1	4	(BG)					
4806		HOLL	05	07	1509	S32	E46	05	11.3		BG	CHO	280	17	11	3
4806		PALE	05	07	1817	S31	E42	05	11.1		B	ESO	250	13	11	2
4806		LEAR	05	08	0019	S32	E40	05	11.2		B	ESO	180	16	11	4
4806		CULG	05	08	0435	S31	E38	05	11.2		BG	DSO	160	9	10	3
4806		SVTO	05	08	0651	S30	E38	05	11.3		B	DSO	220	9	10	3
4806		RAMY	05	08	1255	S31	E33	05	11.1		BG	EHI	210	15	11	4
4806		BOUL	05	08	1325	S31	E33	05	11.2		B	DSO	240	5	9	4
4806	24393	MWIL	05	08	1445	S30	E38	05	11.6	5	(AP)					
4806	24392	MWIL	05	08	1445	S32	E30	05	11.0	4	(BF)					
4806		HOLL	05	08	1520	S31	E33	05	11.2		BG	EHO	260	13	11	3
4806		PALE	05	08	2005	S32	E30	05	11.2		B	ESO	190	10	11	1
4806		LEAR	05	09	0035	S32	E28	05	11.2		BG	ESO	180	18	11	4
4806		CULG	05	09	0500	S30	E25	05	11.2		BG	DSO	100	5	9	1
4806		SVTO	05	09	0619	S32	E25	05	11.2		B	ESO	190	16	12	3
4806		RAMY	05	09	1245	S30	E21	05	11.2		BG	EHO	210	17	12	4
4806		BOUL	05	09	1340	S30	E17	05	10.9		B	ESO	200	6	13	3
4806	24393	MWIL	05	09	1400	S30	E26	05	11.6	5	(AP)					

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MAY 1987

NOAA/ USAF Group	Mt Wilson Group	Sta	Observation Mo Day	Time (UT)	Lat CMD	CMP Mo Day	Max H	Mag Class	Spot Class	Corrected Area (10-6 Hemi)	Spot Count	Long. Extent (Deg)	Qual
4806	24392	MWIL	05 09	1400	S32 E18	05 11.0	4	(BP)					
4806		HOLL	05 09	1450	S30 E20	05 11.2		BG	CSO	180	18	13	3
4806		LEAR	05 10	0205	S32 E16	05 11.3		BG	ESO	120	15	12	2
4806		CULG	05 10	0425	S31 E11	05 11.0		BG	DSO	120	6	10	1
4806		SVTO	05 10	0615	S29 E13	05 11.3		B	ESO	140	13	12	3
4806		RAMY	05 10	1245	S30 E09	05 11.2		BG	ESO	200	17	12	4
4806		BOUL	05 10	1308	S30 E08	05 11.2		B	ESO	270	11	13	2
4806	24393	MWIL	05 10	1410	S31 E13	05 11.6	5	(BG)					
4806	24392	MWIL	05 10	1410	S32 E05	05 11.0	4	(BP)					
4806		HOLL	05 10	1440	S31 E08	05 11.2		BG	CSO	190	18	12	3
4806		PALE	05 10	2004	S32 E05	05 11.2		BG	DSI	210	10	9	2
4806		LEAR	05 11	0043	S32 E04	05 11.3		BG	ESO	110	11	12	3
4806		CULG	05 11	0455	S31 E02	05 11.4		BG	DSO	110	6	9	3
4806		SVTO	05 11	0515	S32 E02	05 11.4		BG	EAI	110	13	12	3
4806		BOUL	05 11	1412	S29 W03	05 11.3		B	CSI	110	13	8	2
4806	24393	MWIL	05 11	1415	S31 W00	05 11.6	5	(BP)					
4806		HOLL	05 11	1415	S31 W04	05 11.3		BG	CSO	140	15	11	3
4806	24392	MWIL	05 11	1415	S32 W08	05 11.0	3	(AP)					
4806		PALE	05 11	1924	S32 W07	05 11.2		B	CSO	140	11	11	2
4806		LEAR	05 12	0207	S31 W10	05 11.3		B	CSO	80	3	9	3
4806		CULG	05 12	0500	S28 W12	05 11.3		B	CSO	80	3	9	3
4806		SVTO	05 12	0705	S30 W14	05 11.2		BG	ESO	110	8	12	3
4806		BOUL	05 12	1318	S29 W13	05 11.5		B	CSO	110	3	6	2
4806	24392	MWIL	05 12	1400	S30 W19	05 11.1	3	(B)					
4806	24393	MWIL	05 12	1400	S31 W12	05 11.6	5	(AP)					
4806		HOLL	05 12	1500	S31 W15	05 11.4		B	CSO	130	3	5	3
4806		RAMY	05 12	1552	S31 W13	05 11.6		B	CSO	80	8	7	2
4806		PALE	05 12	1733	S31 W15	05 11.5		A	HS	110	1	2	3
4806		CULG	05 13	0430	S31 W19	05 11.7		A	HS	80	1	2	2
4806		SVTO	05 13	0840	S32 W26	05 11.3		B	CSO	130	4	7	3
4806		BOUL	05 13	1320	S31 W24	05 11.7		A	HS	120	1	2	3
4806		HOLL	05 13	1425	S31 W26	05 11.5		B	CSO	100	4	5	3
4806	24393	MWIL	05 13	1430	S31 W25	05 11.6	5	(AP)					
4806	24392	MWIL	05 13	1430	S32 W31	05 11.2	3	(B)					
4806		PALE	05 13	2220	S30 W29	05 11.6		A	HS	100	1	2	3
4806		SVTO	05 14	0924	S31 W35	05 11.6		A	HS	130	1	2	3
4806		BOUL	05 14	1320	S29 W37	05 11.6		A	HS	130	1	2	3
4806		RAMY	05 14	1358	S32 W38	05 11.6		A	HA	110	1	2	2
4806	24393	MWIL	05 14	1430	S32 W38	05 11.6	5	(BP)					
4806	24392	MWIL	05 14	1430	S33 W42	05 11.3	2	(BP)					
4806		PALE	05 14	1800	S30 W40	05 11.6		A	HS	110	1	2	4
4806		HOLL	05 14	1818	S31 W40	05 11.6		A	HS	110	1	2	3
4806		CULG	05 15	0445	S31 W46	05 11.6		A	HS	90	1	2	3
4806		BOUL	05 15	1322	S29 W48	05 11.8		A	HS	160	1	2	3
4806		HOLL	05 15	1435	S31 W51	05 11.6		A	HS	70	1	2	3
4806		RAMY	05 15	1509	S31 W51	05 11.6		A	HA	110	1	2	2
4806	24392	MWIL	05 15	1515	S30 W62	05 10.8	2	AP					
4806	24393	MWIL	05 15	1515	S32 W51	05 11.6	5	(AP)					
4806		PALE	05 15	1730	S31 W52	05 11.6		A	HS	90	1	2	4
4806		LEAR	05 16	0114	S31 W56	05 11.6		A	HA	70	1	2	4
4806		CULG	05 16	0405	S30 W57	05 11.7		A	HS	40	1	1	4
4806		SVTO	05 16	0650	S31 W59	05 11.6		A	HS	80	1	2	4
4806		BOUL	05 16	1317	S32 W63	05 11.6		A	AX	30	1	2	2
4806		RAMY	05 16	1350	S31 W63	05 11.6		A	HS	130	1	2	3
4806	24393	MWIL	05 16	1400	S32 W64	05 11.5	5	(AP)					
4806		HOLL	05 16	1535	S31 W64	05 11.6		A	HS	40	1	2	3
4806		PALE	05 16	1817	S30 W65	05 11.6		A	HS	40	1	2	4
4806		LEAR	05 17	0251	S32 W69	05 11.6		A	HA	40	1	2	1
4806		SVTO	05 17	0835	S31 W68	05 12.0		A	HS	120	1	2	3
4806		RAMY	05 17	1314	S32 W75	05 11.6		A	HS	60	1	1	4
4806		BOUL	05 17	1323	S31 W77	05 11.5		A	AX	30	1	2	2
4806		HOLL	05 17	1410	S31 W75	05 11.7		A	HS	40	1	1	3
4806	24393	MWIL	05 17	1445	S32 W76	05 11.6	3	(AP)					
4806		PALE	05 17	1820	S30 W80	05 11.5		A	HS	40	1	1	4
4808		SVTO	05 10	0615	S18 E47	05 13.8		B	BXO	10	4	3	3
4808		RAMY	05 10	1245	S21 E44	05 13.9		B	BXO	20	4	2	4
4808	24395	MWIL	05 10	1410	S22 E45	05 14.0	3	(BF)					

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NOAA/ USAF Group	Mt Wilson Group	Sta	Observat Mo	Day	Hli Time (UT)	Lat	CMD	CMP Mo	Day	Max H	Mag Class	Spot Class	Corrected Area (10-6 Hemi)	Spot Count	Long. Extent (Deg)	Qual
4808		HOLL	05	10	1440	S21	E44	05	14.0		A	AX	10	3	1	3
4808		PALE	05	10	2004	S22	E40	05	13.9		A	AX		1		2
4808		LEAR	05	11	0043	S22	E38	05	13.9		A	AX	10	1	1	3
4808		CULG	05	11	0455	S20	E38	05	14.1		A	AX	10	1		3
4808		SVTO	05	11	0515	S22	E35	05	13.9		B	BXO	10	2	1	3
4808		HOLL	05	11	1415	S21	E31	05	14.0		A	AX	10	2	1	3
4808	24395	MWIL	05	11	1415	S22	E31	05	14.0	3	(AF)					
4808		LEAR	05	12	0207	S22	E25	05	14.0		A	AX	10	1	1	3
4808		CULG	05	12	0500	S24	E22	05	13.9		A	AX		1		3
4808		SVTO	05	12	0705	S23	E22	05	14.0		A	AX		1	1	3
4808		RAMY	05	16	1350	S20	W30	05	14.3		B	BXO	10	3	1	3
4808	24395	MWIL	05	16	1400	S20	W31	05	14.2	3	(B)					
4808		HOLL	05	16	1535	S20	W33	05	14.1		B	BXO	20	5	3	3
4808		PALE	05	16	1817	S19	W34	05	14.2		B	CRO	20	8	4	4
4808		LEAR	05	17	0251	S21	W39	05	14.1		B	DRO	50	5	4	1
4808		SVTO	05	17	0835	S19	W40	05	14.3		B	DRO	30	9	5	3
4808		RAMY	05	17	1314	S20	W45	05	14.1		B	DRO	80	9	5	4
4808		BOUL	05	17	1323	S19	W45	05	14.1		B	BXO	80	7	4	2
4808		HOLL	05	17	1410	S20	W44	05	14.2		B	DSO	60	7	6	3
4808	24395	MWIL	05	17	1445	S20	W46	05	14.1	4	(B)					
4808		PALE	05	17	1820	S19	W48	05	14.1		B	DRO	60	6	6	4
4808		LEAR	05	18	0209	S19	W52	05	14.1		B	DRO	60	4	6	2
4808		CULG	05	18	0300	S20	W53	05	14.1		B	DSO	50	2	3	3
4808		SVTO	05	18	0615	S18	W54	05	14.1		B	DSO	90	3	3	3
4808		BOUL	05	18	1332	S19	W58	05	14.1		B	BXO	20	2	3	2
4808		RAMY	05	18	1426	S20	W58	05	14.2		B	DRO	40	4	6	3
4808	24395	MWIL	05	18	1430	S20	W60	05	14.0	4	(B)					
4808		PALE	05	18	1815	S19	W63	05	13.9		B	BXO	30	4	4	4
4808		HOLL	05	18	1844	S19	W58	05	14.3		B	CSO	60	4	3	1
4808		LEAR	05	19	0028	S19	W67	05	13.9		B	BXO	10	5	3	4
4808		CULG	05	19	0530	S20	W65	05	14.2		B	BXO	50	2	4	2
4808		SVTO	05	19	0727	S19	W69	05	14.0		B	CRO	30	3	3	4
4808		PALE	05	19	1753	S19	W77	05	13.9		B	BXO	30	3	7	4
4808		HOLL	05	19	2116	S19	W78	05	13.9		A	AX		1	1	2
4810		RAMY	05	14	1358	S24	E88	05	21.4		B	BXO	10	2	2	2
4810	24398	MWIL	05	14	1430	S25	E88	05	21.4	2	AF					
4810		PALE	05	14	1800	S26	E86	05	21.4		B	BXO	20	3	3	4
4810		HOLL	05	14	1818	S24	E83	05	21.2		B	CRO	40	2	4	3
4810		CULG	05	15	0445	S26	E76	05	21.1		B	DRI	90	5	6	3
4810		BOUL	05	15	1322	S25	E70	05	21.0		B	CAO	210	3	2	3
4810		HOLL	05	15	1435	S24	E69	05	20.9		B	CSO	110	6	5	3
4810		RAMY	05	15	1509	S24	E70	05	21.0		B	CSO	200	4	5	2
4810	24398	MWIL	05	15	1515	S24	E72	05	21.2	4	(BF)					
4810		PALE	05	15	1730	S24	E68	05	21.0		B	CSO	100	5	8	4
4810		LEAR	05	16	0114	S25	E64	05	21.0		B	CRO	100	4	8	4
4810		CULG	05	16	0405	S24	E62	05	21.0		B	CAO	60	5	5	4
4810		SVTO	05	16	0650	S23	E62	05	21.1		B	CSO	200	5	6	4
4810		BOUL	05	16	1317	S26	E59	05	21.1		B	CAO	140	3	6	2
4810		RAMY	05	16	1350	S24	E58	05	21.0		B	CSO	190	4	6	3
4810	24398	MWIL	05	16	1400	S24	E62	05	21.4	5	(BF)					
4810		HOLL	05	16	1535	S24	E58	05	21.1		B	CSO	150	4	5	3
4810		PALE	05	16	1817	S24	E57	05	21.2		B	CAO	110	7	6	4
4810		LEAR	05	17	0251	S24	E54	05	21.3		A	HS	90	2	4	1
4810		SVTO	05	17	0835	S23	E51	05	21.3		A	HH	170	4	2	3
4810		RAMY	05	17	1314	S23	E48	05	21.2		A	HA	120	6	2	4
4810		BOUL	05	17	1323	S25	E46	05	21.1		B	CAO	120	6	6	2
4810		HOLL	05	17	1410	S24	E46	05	21.1		A	HK	100	1	2	3
4810	24398	MWIL	05	17	1445	S25	E47	05	21.3	5	(AF)					
4810		PALE	05	17	1820	S25	E46	05	21.3		A	HA	90	6	3	4
4810		LEAR	05	18	0209	S23	E40	05	21.2		A	HK	70	6	3	2
4810		CULG	05	18	0300	S24	E39	05	21.1		A	HA	40	2	1	3
4810		SVTO	05	18	0615	S24	E37	05	21.1		A	HA	110	5	2	3
4810		BOUL	05	18	1332	S24	E32	05	21.0		A	HA	50	4	2	2
4810		RAMY	05	18	1426	S23	E34	05	21.2		A	HA	130	1	2	3
4810	24398	MWIL	05	18	1430	S25	E34	05	21.2	4	(AF)					
4810		PALE	05	18	1815	S25	E32	05	21.2		B	CSI	40	7	3	4
4810		HOLL	05	18	1844	S25	E32	05	21.2		A	HK	70	3	3	1

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4810		LEAR	05	19	0028	S24	E28	05	21.2		A	HR	50	8	2	4
4810		CULG	05	19	0530	S24	E27	05	21.3		B	BXO	70	6	2	2
4810		SVTO	05	19	0727	S24	E25	05	21.2		A	HA	90	6	2	4
4810		BOUL	05	19	1340	S24	E20	05	21.1		B	BXO	20	4	1	2
4810		PALE	05	19	1753	S24	E19	05	21.2		A	HAO	30	5	3	4
4810		HOLL	05	19	2116	S24	E18	05	21.3		B	CRO	10	4	3	2
4810		LEAR	05	20	0540	S26	E13	05	21.2		B	CRO	10	6	3	3
4810		CULG	05	20	0545	S24	E14	05	21.3		B	BXO	30	5	2	1
4810		SVTO	05	20	0717	S24	E12	05	21.2		A	HR	10	5	2	4
4810		RAMY	05	20	1430	S24	E07	05	21.1		B	BXO	20	7	4	3
4810		HOLL	05	20	1446	S24	E07	05	21.1		B	BXO	20	8	3	3
4810		PALE	05	20	1912	S24	E06	05	21.3		B	BXO	10	5	3	3
4810		LEAR	05	21	0832	S23	W03	05	21.1		B	BXO	10	5	5	4
4810		HOLL	05	21	1450	S22	W08	05	21.0		B	BXO	10	2	3	3
4811		HOLL	05	14	1818	N27	E87	05	21.5		A	HH	90	1	3	3
4811		CULG	05	15	0445	N27	E81	05	21.5		A	HS	140	1	2	3
4811		BOUL	05	15	1322	N28	E72	05	21.2		B	CKO	270	2	2	3
4811		HOLL	05	15	1435	N28	E74	05	21.4		B	DKI	250	4	6	3
4811		RAMY	05	15	1509	N30	E80	05	21.9		B	DKO	300	7	10	2
4811	24399	MWIL	05	15	1515	N30	E76	05	21.6	4	BP					
4811		PALE	05	15	1730	N30	E80	05	22.0		B	DKI	180	6	15	4
4811		LEAR	05	16	0114	N30	E70	05	21.5		B	EKI	330	6	12	4
4811		CULG	05	16	0405	N28	E69	05	21.6			EAI	250	14	12	4
4811		SVTO	05	16	0650	N30	E68	05	21.6		B	EKI	510	12	11	4
4811		BOUL	05	16	1317	N28	E65	05	21.6		B	CKO	480	6	8	2
4811		RAMY	05	16	1350	N30	E65	05	21.7		B	EKI	470	15	15	3
4811	24399	MWIL	05	16	1400	N31	E62	05	21.5	5	(BP)					
4811		HOLL	05	16	1535	N30	E64	05	21.7		B	EKI	530	15	12	3
4811		PALE	05	16	1817	N28	E65	05	21.8		B	EKI	420	20	11	4
4811		LEAR	05	17	0251	N31	E56	05	21.5		B	EKI	300	11	14	1
4811		SVTO	05	17	0835	N31	E55	05	21.7		B	EKI	340	18	12	3
4811		RAMY	05	17	1314	N32	E54	05	21.8		B	EHI	500	19	13	4
4811		BOUL	05	17	1323	N29	E52	05	21.6		B	EKI	460	9	10	2
4811		HOLL	05	17	1410	N29	E54	05	21.8		B	EKI	370	14	12	3
4811	24399	MWIL	05	17	1445	N31	E53	05	21.8	6	(D)					
4811		PALE	05	17	1820	N29	E51	05	21.8		B	EKI	400	14	12	4
4811		LEAR	05	18	0209	N33	E47	05	21.8		B	EKO	320	12	14	2
4811		CULG	05	18	0300	N29	E43	05	21.5		B	EKO	200	11	12	3
4811		SVTO	05	18	0615	N30	E45	05	21.8		B	EKI	470	16	12	3
4811		BOUL	05	18	1332	N28	E39	05	21.6		B	EKI	340	19	10	2
4811		RAMY	05	18	1426	N33	E41	05	21.8		B	EKI	420	17	13	3
4811	24399	MWIL	05	18	1430	N30	E38	05	21.6	6	(D)					
4811		PALE	05	18	1815	N30	E39	05	21.8		BG	EKI	660	38	13	4
4811		HOLL	05	18	1844	N29	E39	05	21.8		B	EKI	430	26	10	1
4811		LEAR	05	19	0028	N31	E36	05	21.8		B	EHO	590	32	15	4
4811		CULG	05	19	0530	N31	E32	05	21.7		B	EKI	430	26	12	2
4811		SVTO	05	19	0727	N30	E30	05	21.7		B	EKI	540	22	12	4
4811		BOUL	05	19	1340	N29	E26	05	21.6		B	CKI	310	20	10	2
4811		PALE	05	19	1753	N30	E27	05	21.9		BG	EKI	480	39	13	4
4811		HOLL	05	19	2116	N31	E24	05	21.8		BG	EKI	450	19	12	2
4811		LEAR	05	20	0540	N30	E20	05	21.8		B	EKI	400	38	11	3
4811		CULG	05	20	0545	N31	E18	05	21.6		B	EK	550	40	12	1
4811		SVTO	05	20	0717	N30	E18	05	21.7		B	EKI	490	18	12	4
4811		RAMY	05	20	1430	N32	E15	05	21.8		B	EKI	610	26	12	3
4811		HOLL	05	20	1446	N29	E13	05	21.6		B	EKI	530	17	8	3
4811		PALE	05	20	1912	N29	E12	05	21.7		B	EKI	460	20	11	3
4811		CULG	05	21	0400	N29	E07	05	21.7		B	EKC	540	22	12	1
4811		LEAR	05	21	0505	N31	E08	05	21.8		BG	EKI	700	27	14	3
4811		SVTO	05	21	0550	N30	E07	05	21.8		BG	EKI	600	28	14	4
4811		HOLL	05	21	1450	N30	E02	05	21.8		B	EKI	540	38	14	3
4811		RAMY	05	21	2058	N29	W02	05	21.7		B	EKC	550	31	11	2
4811		LEAR	05	22	0145	N31	W05	05	21.7		B	EKI	890	20	12	3
4811		SVTO	05	22	0816	N32	W07	05	21.8		BG	EKI	740	28	13	4
4811		BOUL	05	22	1355	N28	W12	05	21.6		BD	DKC	870	30	10	4
4811	24399	MWIL	05	22	1430	N29	W14	05	21.5	6	(D)					
4811		HOLL	05	22	1540	N29	W11	05	21.8		B	EHI	760	30	12	2
4811		PALE	05	22	1747	N30	W11	05	21.9		B	EHC	750	40	13	4

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4811		RAMY	05 22	2035	N28 W15	05 21.7		B	EKC	740	44	11	2
4811		CULG	05 23	0450	N29 W20	05 21.6		B	EHC	620	24	12	3
4811		SVTO	05 23	0513	N30 W18	05 21.8		B	EHI	640	36	13	3
4811		RAMY	05 23	1223	N28 W26	05 21.5		B	DKC	640	43	9	3
4811	24399	MWIL	05 23	1345	N29 W25	05 21.6	6	(B)					
4811		BOUL	05 23	1403	N28 W24	05 21.7		BD	DKC	850	28	10	2
4811		HOLL	05 23	1810	N30 W25	05 21.8		B	EHI	510	36	14	3
4811		PALE	05 23	1814	N30 W25	05 21.8		B	EHC	600	35	11	3
4811		LEAR	05 24	0018	N30 W30	05 21.6		B	EKI	380	19	14	2
4811		CULG	05 24	0440	N30 W31	05 21.7		B	EHI	500	20	12	3
4811		SVTO	05 24	0640	N28 W30	05 21.9		B	EHI	590	34	12	3
4811	24399	MWIL	05 24	1415	N28 W38	05 21.6	5	(D)					
4811		PALE	05 24	1704	N28 W37	05 21.8		BGD	EKC	570	28	14	3
4811		HOLL	05 24	1805	N30 W38	05 21.8		B	EHI	410	34	13	3
4811		LEAR	05 25	0027	N28 W45	05 21.5		B	EKI	500	22	12	3
4811		CULG	05 25	0455	N29 W42	05 21.9			EKC	250	17	12	3
4811		SVTO	05 25	1145	N30 W48	05 21.7		B	EKI	620	24	13	3
4811		BOUL	05 25	1328	N29 W49	05 21.7		B	EKI	660	20	11	2
4811		RAMY	05 25	1340	N32 W48	05 21.8		BGD	EKI	760	24	13	2
4811		HOLL	05 25	1412	N29 W49	05 21.7		BG	FKI	560	25	16	3
4811		PALE	05 25	1758	N29 W50	05 21.8		B	EKI	550	19	14	3
4811		LEAR	05 26	0144	N29 W57	05 21.6		B	EHI	360	9	12	2
4811		CULG	05 26	0445	N29 W57	05 21.7			ESI	280	12	12	3
4811		SVTO	05 26	0530	N29 W59	05 21.6		B	EHI	540	15	12	3
4811	24399	MWIL	05 26	1330	N28 W62	05 21.7	5	(D)					
4811		RAMY	05 26	1350	N28 W65	05 21.5		B	EKI	210	9	11	2
4811		BOUL	05 26	1444	N27 W63	05 21.7		B	ESI	330	11	11	2
4811		HOLL	05 26	1720	N28 W65	05 21.6		B	FHO	480	10	17	3
4811		PALE	05 26	1815	N29 W65	05 21.7		B	EHO	390	12	14	2
4811		LEAR	05 27	0150	N28 W74	05 21.3		B	EHI	400	11	14	3
4811		CULG	05 27	0230	N29 W69	05 21.7		B	DSO	240	8	9	2
4811		SVTO	05 27	0545	N28 W73	05 21.5		B	EHI	420	9	15	3
4811		BOUL	05 27	1306	N27 W76	05 21.6		B	EHI	340	4	10	1
4811		HOLL	05 27	1542	N28 W78	05 21.5		B	FHO	280	4	18	4
4811		PALE	05 27	1828	N29 W80	05 21.5		B	EKI	360	9	14	3
4811		LEAR	05 28	0120	N27 W89	05 21.1		B	BXO	20	3	11	3
		SVTO	05 23	0900	N03 E22	05 25.0		B	BXO		2	2	3
4812		SVTO	05 25	1145	N23 E37	05 28.3		A	AX	20	2	1	3
4812		BOUL	05 25	1328	N25 E34	05 28.2		A	AX	10	1	1	2
4812		RAMY	05 25	1340	N24 E36	05 28.3		A	AX	10	1	1	2
4812		HOLL	05 25	1412	N23 E36	05 28.4		A	AX	10	1	1	3
4812		PALE	05 25	1758	N23 E35	05 28.4		B	BXO	10	2	5	3
4812		LEAR	05 26	0144	N23 E31	05 28.5		B	BXO	20	4	4	2
4812		CULG	05 26	0445	N22 E29	05 28.4		B	BXO	10	3	5	3
4812		SVTO	05 26	0530	N24 E29	05 28.5		B	BXO	10	4	5	3
4812	24401	MWIL	05 26	1330	N23 E26	05 28.6	4	(BF)					
4812		RAMY	05 26	1350	N23 E26	05 28.6		A	AX	10	1	1	2
4812		BOUL	05 26	1444	N23 E23	05 28.4		B	BXO	10	2	3	2
4812		HOLL	05 26	1720	N24 E23	05 28.5		A	AX	10	1	1	3
4812		PALE	05 26	1815	N22 E21	05 28.4		A	AX	10	1	1	2
4812		LEAR	05 27	0150	N23 E17	05 28.4		B	BXO	20	5	5	3
4812		CULG	05 27	0230	N21 E18	05 28.5		B	BXO	10	3	4	2
4812		SVTO	05 27	0545	N23 E16	05 28.5		B	CRO	60	6	6	3
4812		BOUL	05 27	1306	N22 E11	05 28.4		B	DSO	80	6	6	1
4812		HOLL	05 27	1542	N23 E09	05 28.3		B	DSO	70	8	6	4
4812		PALE	05 27	1828	N23 E09	05 28.5		B	DSO	80	11	7	3
4812		LEAR	05 28	0120	N23 E05	05 28.4		B	CSO	100	13	8	3
4812		CULG	05 28	0450	N22 E02	05 28.3		B	DSO	100	11	8	2
4812		SVTO	05 28	0705	N22 E02	05 28.4		B	CSO	130	10	8	3
4812		BOUL	05 28	1320	N23 W03	05 28.3		B	CAO	130	8	6	3
4812	24401	MWIL	05 28	1330	N23 W02	05 28.4	5	(B)					
4812		HOLL	05 28	1520	N22 W04	05 28.3		B	CSO	80	8	9	3
4812		PALE	05 28	1833	N25 W05	05 28.4		B	CSO	130	6	9	4
4812		LEAR	05 29	0004	N23 W07	05 28.5		B	CSO	60	5	9	3
4812		CULG	05 29	0500	N22 W15	05 28.0		B	CSO	60	4	9	2
4812	24401	MWIL	05 29	1355	N22 W14	05 28.5	5	(BF)					

S U N S P O T G R O U P S
(ORDERED BY CENTRAL MERIDIAN PASSAGE DATE)

MAY 1987

NOAA/ USAF Group	Mt Wilson Group	Sta	Observation Mo	Day	Time (UT)	Lat	CMD	CMP Mo	Day	Max H	Mag Class	Spot Class	Corrected Area (10-6 Hemi)	Spot Count	Long. Extent (Deg)	Qual
4812		BOUL	05	29	1415	N22	W16	05	28.4		B	CAO	100	8	7	3
4812		RAMY	05	29	1435	N23	W15	05	28.4		B	CSO	90	4	9	3
4812		HOLL	05	29	1520	N22	W16	05	28.4		B	CSO	60	5	8	3
4812		PALE	05	29	1731	N23	W17	05	28.4		B	DSO	80	7	7	3
4812		SVTO	05	30	0515	N23	W23	05	28.4		B	CSO	60	6	8	3
4812		CULG	05	30	0520	N22	W25	05	28.3		B	CSO	60	5	9	3
4812		RAMY	05	30	1229	N22	W28	05	28.4		B	CSO	60	6	9	3
4812		BOUL	05	30	1319	N22	W28	05	28.4		B	CAO	90	7	8	3
4812	24401	MWIL	05	30	1330	N22	W26	05	28.6	4	(BF)					
4812		PALE	05	30	1758	N23	W26	05	28.7		A	HS	50	3	2	4
4812		LEAR	05	31	0049	N23	W30	05	28.7		A	HS	30	2	1	3
4812		CULG	05	31	0440	N21	W31	05	28.8		A	HS	20	2	1	2
4812	24401	MWIL	05	31	1330	N22	W37	05	28.7	4	(BF)					
4812		RAMY	05	31	1356	N23	W42	05	28.3		B	CAO	60	5	9	3
4812		HOLL	05	31	1402	N22	W40	05	28.5		B	CSO	30	4	7	4
4812		BOUL	05	31	1426	N22	W36	05	28.8		A	HA	30	1	2	1
4812		PALE	05	31	1724	N22	W38	05	28.8		A	HS	40	2	2	3
4812		LEAR	06	01	0000	N23	W45	05	28.6		B	CSO	20	4	8	3
4812		CULG	06	01	0340	N22	W48	05	28.6		B	CRO	30	4	8	2
4812		SVTO	06	01	0537	N22	W49	05	28.6		B	DSO	60	5	8	3
4812		RAMY	06	01	1315	N22	W55	05	28.4		B	DRO	70	4	9	4
4812		BOUL	06	01	1327	N23	W53	05	28.6		B	BXO	40	4	10	2
4812	24401	MWIL	06	01	1330	N22	W55	05	28.3	4	(BF)					
4812		HOLL	06	01	1512	N22	W55	05	28.5		B	CRO	30	4	8	3
4812		PALE	06	01	1702	N23	W55	05	28.6		B	CRO	60	4	9	4
4812		CULG	06	02	0400	N22	W60	05	28.6		A	AX	10	1		2
4812		SVTO	06	02	0551	N22	W57	05	29.0		A	AX	10	2	1	3
4812	24401	MWIL	06	02	1330	N22	W64	05	28.6	3	(B)					
4812		RAMY	06	02	1345	N22	W63	05	28.8		A	AX	10	1	1	2
4812		HOLL	06	02	1545	N23	W65	05	28.7		A	AX	10	1	1	3

Stations reporting:

BOUL = Boulder
CULG = Culgoora
HOLL = Holloman
LEAR = Learmonth
MWIL = Mt. Wilson
PALE = Palehua
RAMY = Ramey
SVTO = San Vito

MAY 1987

Day	Start (UT)	Max (UT)	End (UT)	Imp	Wide-spread Index	Number of Station Reports by Type SWF	SEA	SPA	LF-SPA	SES	Known Flare	X-ray Class	NOAA/SESC Region
01	1847	1850	1910	2	3					8	1836 UT		4803
02	0203	0214	0313	1-	1			1			0201 UT	C3.4	
07	0909	0927U	1008	1	1		1				No flare		
08	0857	0913	0937	1+	1		1				No flare		
15	0030	0037	0120	1-	1			1			No flare		
16	0945	0947	1010	1	3	1	1	1	1	3	0944 UT	C2.7	
16	1038	1047	1055	1-	3	1			1	2	1037 UT	C1.5	
16	1056	1059	1110	1-	3	1			1	1	1055 UT		4811
16	1112	1114	1130	1-	3				1	2	1109 UT	C1.6	4811
16	1148	1150	1157	1-	3	1	1		1	2	1148EUT	C1.2	4811
17	0842	0858	0958	1	5	3	2	1	2	4	0837 UT	C4.9	4808
17	1512	1517U	1603	1	1		1				1457 UT		4811
19	0004	0010	0053	1-	1			1			0004 UT	C1.9	4808
19	0551	0558	0610	1-	1			1			0536 UT		4808
19	1252	1302	1320	1-	3	1	1	1	1	4	1252 UT	C2.6	4811
19	1801	1818	1915	1-	3			1		7	1808EUT	C9.6	4811
21	0323	0333	0516	2	3	1	1	1			0318 UT	C7.6	4811
21	1823	1824	1900	2	3					2	1831EUT	C2.1	4811
22	0307	0316	0350	1-	1			1			0309 UT		4811
22	0557	0604	0641	1-	1			1			0557 UT		4811
22	1235	1246	1314	1-	5	3	3	1	1	7	1236 UT	C4.8	4811
23	1140	1148	1220	1-	3	1	2		1	2	1130 UT	C1.6	
24	0105	0130	0217	1-	1			1			0103 UT	C1.0	4811
24	0906	0911	0930	1-	3			1	1	1	0907 UT	C1.3	4811
24	1239	1249	1336	1+	3					3	1229 UT		4811
24	1527	1540	1556	1-	5	3	3	1	1	10	1518 UT	M1.2	4811
24	1800	1803	1820	1	3					3	1754 UT	C2.3	4811
24	2318	2330	2354	1-	1			1			2325 UT	C1.6	
25	0320	0323	0342	1-	1			1			0317 UT	C1.6	4811
25	0504E	0515	0555	1-	1			1			0501 UT	C2.3	
25	1210	1220	1240	1-	3				1	3	1207 UT	C1.4	4811
25	1344	1352	1420	1-	3	1	1		1	3	1344 UT	C2.2	4811
25	1613	1629	1722	1-	3			1		2	1609 UT	C4.2	4811
25	1827	1848	1915	2	1					1	No flare		
25	1853	1907	2015	1-	3			1		6	1850 UT	C5.9	4811
26	0610	0617	0712	1-	3	1		1	1	2	0610 UT	C2.8	4811
26	0748	0753	0836	1-	3			1	1	1	0743 UT	C1.3	4811
26	1720	1723	1815	2	1					1	1717 UT	C2.7	
28	0045	0048	0104	1-	1			1			0043 UT	C1.2	
29	0143	0216	0332	1-	1			1			0138 UT	C1.7	
29	1617	1627	1657	1-	3		1	1		6	No flare		

SUDDEN IONOSPHERIC DISTURBANCES

MAY 1987

OBSERVATORIES REPORTING FOR MAY 1987**

Ayrshire, Scotland	SES	Louisville, Kentucky, USA	SES
Darmstadt, German Federal Republic	SWF	Maui, Hawaii, USA	SWF
Edenvale, Republic of S. Africa	SES	Panska Ves, Czechoslovakia	SEA, SWF, SES
Farsta, Sweden	SES	Paterson, New Jersey, USA (A03)	SES
Hiraiso, Japan	SWF	Paterson, New Jersey, USA (A46)	SES
Houston, Texas, USA	SES	Sao Paulo, Brasil	SPA, SES
Inubo, Japan	SPA	Sofia, Bulgaria	SES
Juliusruh, German Democratic Rep.	SWF	Somersworth, New Hampshire, USA	SES
Kandilli, Turkey	SEA	Tavares, Florida, USA	SES
Kuhlungsborn, German Democratic Rep.	SPA, SEA	Tucson, Arizona, USA	SES
Latrobe, Pennsylvania, USA	SES	Upice, Czechoslovakia	SEA
Lintong, Peoples Republic of China	SPA	Valley Cottage, New York, USA	SES

**Observations are not necessarily continuous.

SIDs by NOAA/SESC REGIONS

MAY 1987

Day:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Events in Region #																															
4803	1																														
4808																	1		2												
4811																3	1		2		2	3		5	5	2					
Events with X-ray		1														4	1		3		2	1	1	5	6	3		1	1		
Events with no flare reported							1	1							1										1				1		
Events with no flare patrol																															
Events with flare but no region number		1														2							1	1	1	1		1	2		
Daily Event Totals	1	1					1	1							1	5	2		4		2	3	1	6	7	3		1	2		

SOLAR RADIO EMISSION SPECTRAL OBSERVATIONS

MAY 1987

Day	Observation Start (UT)	Observation End (UT)	Sta	Decimetric Band Start (UT)	Decimetric Band End (UT)	Decimetric Band Int (1-3)	Metric Band Start (UT)	Metric Band End (UT)	Metric Band Int (1-3)	Dekametric Band Start (UT)	Dekametric Band End (UT)	Dekametric Band Int (1-3)	Spectral Type
01	0446	1644	WEIS				1511.3	1511.4	2				IIIB
	1647	1811	WEIS										
			PALE				1921.0	1921.0	1				III
02			LEAR				0204.0	0204.0	1				V
			PALE				0204.0	0207.0	1				III
			LEAR				0206.0	0207.0	2				III
	0443	1811	WEIS										
03	0443	1814	WEIS										
04	0441	1258	WEIS										
	1304	1815	WEIS										
05	0441	0641	WEIS										
			LEAR				0743.0	0744.0	2				III
	1252	1817	WEIS										
			PALE				1910.0	1910.0	1				III
06	0438	1817	WEIS										
07	0528	1515	WEIS				0528.3	0528.5	2				IIIB
			CULG				0529.0	0529.0	1				III
			LEAR				0534.0	0536.0	2				III
			WEIS				0535.7	0536.0	3				U
			CULG				0536.0	0536.0	1				III
			LEAR				0618.0	0619.0	1				III
			WEIS				0619.3	0619.6	2				IIIG
			CULG				0620.0	0620.0	1				III
			CULG				0627.0	0627.0	1				III
			CULG				0658.0	0658.0	1				III
			LEAR				0734.0	0737.0	2				III
			WEIS				0735.4	0738.7	3				IIIG
			SVTO				0737.0	0738.0	1				III
			LEAR				0904.0	0904.0	2				III
			SVTO				0906.0	0906.0	1				III
			WEIS				0906.3	0906.6	3				IIIG
			WEIS				1113.4	1113.7	2				IIIB
			SGMR				1120.0	1120.0	1				III
			SVTO				1120.0	1120.0	1				III
			WEIS				1120.0	1120.2	2				IIIG
			WEIS				1152.7	1153.4	2				IIIG
			WEIS				1315.6	1317.4	3				IIIG
			SGMR				1316.0	1318.0	2				V
			SVTO				1316.0	1318.0	2				V
	1523	1819	WEIS										
			SGMR				1904.0	1905.0	2				V
			CULG				2105.0	2117.0	1				III
			CULG				2207.0	2207.0	1				III
			CULG				2223.0	2223.0	1				III
			CULG				2234.0	2234.0	2				III
			CULG				2258.0	2300.0	2				III
			LEAR				2258.0	2258.0	1				III
			CULG				2325.0	2325.0	1				III
08			PALE				0032.0	0035.0	2				III
			CULG				0033.0	0038.0	3				III
			LEAR				0033.0	0033.0	2				III
			LEAR				0034.0	0037.0	3				V
			CULG				0109.0	0109.0	2				III
			LEAR				0109.0	0109.0	2				III
			CULG				0139.0	0139.0	1				III
			LEAR				0139.0	0139.0	2				III
			CULG				0159.0	0159.0	1				III
			LEAR				0159.0	0201.0	2				V
			CULG				0243.0	0243.0	2				III
			LEAR				0243.0	0244.0	2				III
			CULG				0333.0	0342.0	2				III
			LEAR				0333.0	0333.0	2				III
			LEAR				0336.0	0340.0	2				V
			PALE				0336.0	0337.0	1				III

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

MAY 1987

Day	Observation Start (UT)	Observation End (UT)	Sta	Decimetric Band Start (UT)	Decimetric Band End (UT)	Decimetric Band Int (1-3)	Metric Band Start (UT)	Metric Band End (UT)	Metric Band Int (1-3)	Dekametric Band Start (UT)	Dekametric Band End (UT)	Dekametric Band Int (1-3)	Spectral Type
08			LEAR				0340.0	0341.0	2				III
			LEAR				0416.0	0417.0	2				III
			CULG				0421.0	0421.0	2				III
			LEAR				0447.0	0448.0	2				III
	0435	1819	WEIS				0447.9	0448.2	3				IIIB
			CULG				0448.0	0448.0	2				III
			CULG				0505.0	0513.0	2				III
			LEAR				0505.0	0512.0	3				III
			WEIS				0505.0	0505.5	1				IIIG
			SVTO				0511.0	0512.0	2				III
			WEIS				0511.6	0512.5	3				IIIG
09	0435	0753	WEIS										
	0848	1822	WEIS										
10	0432	1822	WEIS										
			SVTO				1600.0	1600.0	1				III
11	0433	1813	WEIS										
12	0539	1823	WEIS										
13	0430	1143	WEIS										
	1302	1827	WEIS										
			PALE				2006.0	2008.0	1				III
14	0427	1828	WEIS										
15			LEAR				0247.0	0248.0	2				III
			LEAR				0325.0	0326.0	2				III
			PALE				0329.0	0329.0	1				III
	0427	0452	WEIS										
			LEAR				0756.0	0756.0	1				III
			SVTO				0756.0	0756.0	1				III
			SVTO				1517.0	1517.0	1				III
			SVTO				1541.0	1541.0	1				III
	0555	1829	WEIS				1541.4	1542.2	3				IIIG
			WEIS				1648.8	1648.9	2				IIIB
			SGMR				1816.0	1817.0	1				V
16			LEAR				0333.0	0354.0	2				CONT
			CULG				0335.0	0348.0	1				III
			PALE				0346.0	0346.0	1				III
			PALE				0421.0	0421.0	2				III
			CULG				0436.0	0436.0	1				III
			LEAR				0440.0	0440.0	1				III
			CULG				0553.0	0600.0	1				III
			LEAR				0553.0	0559.0	2				V
	0425	1218	WEIS				0553.2	0556.1	2				IIIGG
			SVTO				0554.0	0555.0	2				III
			WEIS				0556.8	0557.1	2				IIIG
			WEIS				0559.0	0559.2	1				IIIG
			LEAR				0614.0	0630.0	3				S
			CULG				0615.0	0636.0	2				III
			WEIS				0615.0	0618.1	1				IIIG
			SVTO				0621.0	0630.0	2				III
			WEIS				0621.0	0625.4	2				IIIGG
			WEIS				0628.5	0630.2	2				IIIGG
			LEAR				0814.0	0814.0	1				III
			SVTO				0814.0	0814.0	2				III
			WEIS				0814.1	0814.3	2				IIIG
			WEIS				0857.2	0857.3	1				IIIB
			SVTO				0917.0	0918.0	2				III
			WEIS				0917.7	0918.1	2				IIIG
			SVTO				1011.0	1013.0	2				III
			WEIS				1012.8	1014.3	2				IIIG
			WEIS				1120.2	1122.2	3				IIIG
			SVTO				1121.0	1122.0	2				III
			WEIS				1125.0	1125.8	2				IIIG
			SVTO				1226.0	1231.0	2				V
			SGMR				1227.0	1232.0	2				V

SOLAR RADIO EMISSION SPECTRAL OBSERVATIONS

MAY 1987

Observation Day	Start (UT)	End (UT)	Sta	Decimetric Band Start (UT)	End (UT)	Int (1-3)	Metric Band Start (UT)	End (UT)	Int (1-3)	Dekametric Band Start (UT)	End (UT)	Int (1-3)	Spectral Type
16			SVTO				1320.0	1320.0	2				III
	1244	1830	WEIS				1321.0	1321.3	2				IIIG
			SGMR				1322.0	1323.0	1				V
			SGMR				1337.0	1337.0	1				V
			SVTO				1337.0	1337.0	1				III
			WEIS				1337.2	1337.3	1				IIIB
			SGMR				1341.0	2336.0	1				CONT
			WEIS				1342.2	1342.6	2				IIIG
			WEIS				1344.7	1346.5	2				IIIGG
			WEIS				1349.4	1350.2	2				IIIG
			WEIS				1359.7	1359.8	3				IIIB
			SVTO				1514.0	1514.0	1				III
			SGMR				1534.0	1551.0	2				V
			SVTO				1534.0	1551.0	2				S
			WEIS				1534.5	1551.2	2				IIIGG
			PALE				1823.0	1823.0	1				III
			CULG				2141.0	2210.0	1				III
			PALE				2156.0	2156.0	1				III
			PALE				2203.0	2204.0	1				III
			CULG				2310.0	2328.0	1				III
			PALE				2313.0	2314.0	2				III
17			CULG				0004.0	0005.0	3				III
			CULG				0021.0	0052.0	2				III
			LEAR				0024.0	0035.0	2				S
			PALE				0024.0	0035.0	2				S
			LEAR				0042.0	0049.0	2				III
			PALE				0042.0	0049.0	1				III
			CULG				0119.0	0123.0	1				III
			PALE				0140.0	0150.0	3				V
			CULG				0141.0	0157.0	3				III
			CULG				0219.0	0220.0	2				III
			PALE				0219.0	0219.0	2				III
			CULG				0241.0	0257.0	1				III
			LEAR				0250.0	0257.0	2				III
			PALE				0250.0	0251.0	1				III
			CULG				0321.0	0321.0	1				III
			CULG				0419.0	0419.0	1				III
	0426	1831	WEIS				0428.8	0428.9	1				IIIB
			CULG				0429.0	0430.0	1				III
			LEAR				0510.0	0516.0	2				III
			SVTO				0510.0	0514.0	1				III
			WEIS				0510.8	0516.5	2				IIIG
			CULG				0511.0	0517.0	2				III
			LEAR				0530.0	0531.0	1				III
			WEIS				0530.8	0534.2	2				IIIG
			CULG				0531.0	0612.0	1				III
			WEIS				0535.7	0538.0	2				DCIM
			SVTO				0543.0	0556.0	2				S
			WEIS				0543.7	0543.9	2				IIIG
			WEIS				0545.8	0548.3	2				IIIG
			LEAR				0547.0	0557.0	1				S
			CULG				0551.0	0553.0	2				III
			WEIS				0552.6	0553.2	2				IIIG
			LEAR				0611.0	0611.0	1				III
			WEIS				0611.4	0611.5	2				IIIB
			CULG				0707.0	0708.0	1				III
			LEAR				0707.0	0707.0	1				III
			WEIS				0707.1	0707.3	2				IIIG
			WEIS				0717.7	0719.0	2				IIIG
			LEAR				0718.0	0720.0	1				III
			SVTO				0850.0	0852.0	1				III
			SVTO				0950.0	0952.0	1				III
			WEIS				1326.0	1326.5	2				IIIG
			SGMR				1812.0	1817.0	2				V
			PALE				1813.0	1816.0	3				V
			WEIS				1816.6	1816.7	3				IIIB
			PALE				2129.0	2130.0	2				V
			SGMR				2129.0	2130.0	1				III
			CULG				2203.0	2203.0	1				III
18			PALE				0049.0	0050.0	1				III

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18			PALE				0202.0	0202.0	1				III
			LEAR				0203.0	0204.0	1				III
			CULG				0526.0	0533.0	1				III
			CULG				0614.0	0630.0	1				III
			LEAR				0636.0	0637.0	1				III
			SVTO				0636.0	0636.0	1				III
	0636	1810	WEIS				0636.0	1810.0	2				IN
			CULG				0637.0	0638.0	1				III
			LEAR				0808.0	0809.0	1				III
			SVTO				0810.0	0810.0	1				III
			LEAR				0811.0	0811.0	1				III
			SVTO				0841.0	0841.0	1				III
			SVTO				0851.0	0851.0	1				III
			SVTO				0903.0	0910.0	2				III
			LEAR				0941.0	0941.0	1				III
			SVTO				0948.0	1005.0	2				S
			SVTO				1114.0	1118.0	2				V
			SGMR				1115.0	1116.0	1				V
			SVTO				1131.0	1208.0	2				S
			SGMR				1136.0	2338.0	1				CONT
			SGMR				1321.0	1322.0	2				V
			SVTO				1321.0	1322.0	2				III
			SVTO				1333.0	1349.0	2				S
			SGMR				1354.0	1354.0	2				V
			SVTO				1412.0	1413.0	2				III
			SVTO				1553.0	1554.0	2				III
			SGMR				1554.0	1554.0	2				V
			WEIS	1630.4	1649.8	3							IIIGG
			SGMR				1631.0	1642.0	2				V
			SVTO				1633.0	1640.0	2				V
			PALE				1808.0	1809.0	2				V
			PALE				1842.0	1940.0	2				S
			PALE				2021.0	2033.0	2				S
			PALE				2047.0	2048.0	1				III
			PALE				2213.0	2214.0	2				V
			PALE				2248.0	2249.0	1				III
			PALE				2301.0	2338.0	2				CONT
			LEAR				2315.0	2323.0	2				III
19			PALE				0058.0	0112.0	1				S
			LEAR				0216.0	0226.0	3				III
			PALE				0217.0	0226.0	2				III
			LEAR				0327.0	0327.0	1				III
			PALE				0327.0	0327.0	1				III
			LEAR				0416.0	0416.0	2				III
			PALE				0421.0	0422.0	1				III
			LEAR				0443.0	0458.0	1				S
	0423	0700	WEIS				0443.0	1649.0	2				IN
			LEAR				0532.0	0533.0	1				III
			LEAR				0603.0	0653.0	3				S
			SVTO				0618.0	0618.0	2				III
			SVTO				0627.0	0644.0	2				V
			WEIS	0627.7	0645.0	3							IIIGG
			LEAR				0708.0	0933.0	1				CONT
			SVTO				0709.0	0709.0	2				III
			SVTO				0717.0	0815.0	2				S
			SVTO				0841.0	1220.0	2				CONT
			SVTO				1243.0	1648.0	2				CONT
	0708	1834	WEIS	1254.3	1255.6	2							IIIG
			SGMR				1323.0	2339.0	1				CONT
			SGMR				1326.0	1328.0	2				V
			SGMR				1348.0	1349.0	2				V
			SGMR				1615.0	1622.0	2				S
			PALE				1759.0	1833.0	3				II
			WEIS				1759.2	1816.5	2				IIIGG
			SGMR				1800.0	1834.0	3				II
			WEIS	1804.4	1806.4	3							IIIGG,RS
			WEIS				1809.3	1814.4	2				II HARM
			PALE				1833.0	0311.0	3				CONT
			CULG				2046.0	2200.0	1				I
			LEAR				2339.0	2342.0	2				III

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20			LEAR				0002.0	0932.0	1				CONT
			PALE				0424.0	0440.0	1				S
			WEIS				0424.0	1832.0	2				III S
	0421	1253	WEIS				0424.0	1833.0	2				IS,DC
			SVTO				0425.0	0427.0	2				V
			SVTO				0439.0	0440.0	2				V
			WEIS	0442.0	0530.0	2							DCIM
			SVTO				0514.0	1740.0	2				CONT
			LEAR				0636.0	0637.0	3				III
			LEAR				0648.0	0649.0	3				III
			WEIS	0736.0	0829.0	3							DCIM
			WEIS	0940.8	0950.8	2							DCIM
			SGMR				1252.0	2339.0	1				CONT
			SGMR				1334.0	1335.0	2				V
	1315	1832	WEIS	1334.8	1334.9	2							III G
			PALE				1721.0	1725.0	1				V
			SGMR				1722.0	1725.0	2				V
			PALE				1735.0	0448.0	2				CONT
			PALE				1946.0	1950.0	2				V
			SGMR				2046.0	2047.0	2				V
			CULG				2047.0		2				I
			SGMR				2122.0	2124.0	2				V
			LEAR				2330.0	2336.0	3				III
			PALE				2331.0	2340.0	3				V
			LEAR				2344.0	0050.0	1				CONT
21			LEAR				0032.0	0036.0	2				III
			LEAR				0119.0	0121.0	2				III
			LEAR				0202.0	0202.0	2				III
			LEAR				0234.0	0234.0	2				III
			LEAR				0257.0	0331.0	3				S
			PALE				0310.0	0328.0	2				S
			CULG				0323.0	0343.0	3				II
			PALE				0330.0	0345.0	2				II
			LEAR				0332.0	0345.0	3				II
			LEAR				0342.0	0932.0	3				IV
			SVTO				0404.0	0405.0	1				III
			SVTO				0415.0	1650.0	2				CONT
	0641	1835	WEIS				0640.0	1735.0	3				IS,DC
			WEIS	0844.2	0850.6	3							III GG
			WEIS				0909.0	1835.0	3				III S
			SGMR				1147.0	1152.0	2				V
			SGMR				1204.0	1207.0	2				V
			SGMR				1310.0	1312.0	2				V
			SGMR				1345.0	1347.0	2				V
			SGMR				1545.0	1545.0	2				V
			SGMR				1557.0	1601.0	2				V
			PALE				1648.0	1743.0	1				S
			SGMR				1650.0	1651.0	2				V
			SVTO				1650.0	1651.0	2				V
			SGMR				1724.0	1724.0	2				V
			PALE				1752.0	1813.0	2				S
			SGMR				1755.0	1756.0	2				V
			PALE				1821.0	1824.0	1				III
			PALE				1831.0	1840.0	2				V
			SGMR				1834.0	1835.0	2				V
			PALE				1843.0	1909.0	1				S
			PALE				1910.0	1920.0	2				V
			SGMR				1911.0	1914.0	2				V
			PALE				1930.0	1948.0	1				S
			PALE				1957.0	1958.0	2				V
			PALE				2005.0	0247.0	1				CONT
			PALE				2050.0	2050.0	2				V
			PALE				2059.0	2059.0	2				V
			PALE				2211.0	2215.0	3				V
			SGMR				2215.0	2215.0	2				V
			LEAR				2308.0	2313.0	1				III
			PALE				2335.0	2348.0	3				V
			LEAR				2337.0	2348.0	2				S
22			CULG				0000.0	0728.0	2				S

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22			LEAR				0020.0	0932.0	1				CONT
			LEAR				0251.0	0252.0	2				III
			LEAR				0403.0	0409.0	2				III
			LEAR				0432.0	0433.0	2				III
	0419	0623	WEIS	0503.0	1753.0	2							IDC
			SVTO				0527.0	0528.0	2				III
	0625	1837	WEIS				0527.0	1521.0	3				IIIN
			LEAR				0528.0	0534.0	2				III
			SVTO				0534.0	0534.0	2				III
			LEAR				0548.0	0549.0	2				III
			LEAR				0554.0	0623.0	3				S
			SVTO				0554.0	0620.0	2				S
			LEAR				0726.0	0729.0	2				V
			SVTO				0726.0	0727.0	2				V
			SVTO				0755.0	0755.0	1				III
			SVTO				0844.0	0845.0	1				III
			SVTO				0903.0	0903.0	2				III
			SVTO				0915.0	0917.0	2				V
			SVTO				0934.0	0934.0	1				III
			SGMR				0938.0	2340.0	1				CONT
			SVTO				0950.0	1013.0	2				S
			SVTO				1152.0	1235.0	2				S
			SGMR				1221.0	1221.0	2				V
			SVTO				1446.0	1446.0	1				III
			SVTO				1454.0	1455.0	2				V
			SGMR				1455.0	1456.0	2				V
			SVTO				1520.0	1520.0	1				III
			PALE				1829.0	1829.0	1				III
			PALE				1853.0	1855.0	3				V
			SGMR				1853.0	1857.0	2				V
			PALE				1857.0	1927.0	2				S
			SGMR				1910.0	1910.0	2				V
			PALE				2000.0	2001.0	1				III
			PALE				2005.0	2010.0	2				V
			SGMR				2005.0	2006.0	2				V
			PALE				2022.0	2038.0	2				S
			PALE				2102.0	2125.0	1				S
			PALE				2129.0	2151.0	2				S
			SGMR				2130.0	2131.0	2				V
			CULG				2228.0	0728.0	1				I
			PALE				2237.0	2238.0	1				III
			PALE				2250.0	2250.0	1				III
			PALE				2308.0	2314.0	1				III
			PALE				2315.0	2316.0	1				V
23			LEAR				0041.0	0047.0	1				III
			PALE				0044.0	0046.0	1				III
			LEAR				0606.0	0606.0	1				III
			SVTO				0634.0	0635.0	2				III
	0420	1838	WEIS				0634.0	1837.0	1				IIIN
			LEAR				0635.0	0635.0	2				III
			LEAR				0650.0	0658.0	1				III
			LEAR				0736.0	0744.0	2				III
			SVTO				0736.0	0744.0	2				III
			LEAR				0831.0	0832.0	1				III
			SVTO				0832.0	0832.0	1				III
			SVTO				0844.0	0847.0	2				III
			SVTO				1153.0	1154.0	2				V
			WEIS				1153.8	1154.7	2				IIIG
			SGMR				1154.0	1155.0	2				V
			SVTO				1228.0	1228.0	1				III
			SVTO				1336.0	1336.0	1				III
			SVTO				1438.0	1649.0	1				CONT
			PALE				1653.0	1654.0	1				V
			PALE				1704.0	1704.0	1				V
			PALE				1723.0	1728.0	1				III
			PALE				1822.0	1901.0	1				S
			PALE				1933.0	1943.0	1				S
			PALE				2004.0	2004.0	1				III
			PALE				2028.0	2029.0	1				III
			PALE				2143.0	2243.0	1				S

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23			PALE				2151.0	0254.0	3				CONT
			SGMR				2322.0	2323.0	2				V
			SGMR				2333.0	2337.0	2				V
24			LEAR				0006.0	0011.0	3				V
			LEAR				0032.0	0033.0	2				III
			LEAR				0045.0	0108.0	3				S
			LEAR				0123.0	0153.0	2				S
			LEAR				0213.0	0214.0	1				III
			LEAR				0224.0	0226.0	1				III
			LEAR				0254.0	0254.0	1				III
			LEAR				0329.0	0329.0	1				III
			PALE				0329.0	0329.0	1				III
			LEAR				0450.0	0456.0	1				III
			LEAR				0511.0	0512.0	1				III
			LEAR				0844.0	0852.0	2				III
			SVTO				0849.0	0851.0	2				V
			WEIS				0849.3	0851.5	2				IIIG
			SVTO				0900.0	0904.0	1				III
			SVTO				0912.0	1743.0	2				IV
	0417	1447	WEIS				0928.0	1407.0	3				IN
			WEIS				1058.0	1252.0	2				IIIS
			WEIS				1127.7	1127.9	2				IIIB
			SGMR				1211.0	1212.0	2				V
			WEIS				1211.2	1212.4	3				IIIGG
			WEIS	1238.7	1251.7	2							IIIGG
			SGMR				1239.0	2343.0	1				CONT
			WEIS				1344.7	1346.2	2				IIIG
			PALE				1656.0	1708.0	1				III
			PALE				1710.0	1713.0	2				V
			SGMR				1710.0	1713.0	2				V
			PALE				1716.0	1716.0	1				III
			PALE				1728.0	1737.0	2				V
	1731	1839	WEIS										
			PALE				1838.0	1852.0	1				S
			PALE				1919.0	1927.0	2				V
			SGMR				1921.0	1923.0	2				V
			PALE				1933.0	2328.0	1				CONT
			SGMR				2036.0	2037.0	1				III
			PALE				2050.0	2121.0	2				S
			CULG				2051.0	2100.0	1				III
			CULG				2101.0	2135.0	3				III
			SGMR				2101.0	2130.0	2				S
			CULG				2135.0	2227.0	1				I
			CULG				2148.0	2148.0	1				III
			CULG				2244.0	2328.0	1				S
25			PALE				0013.0	0014.0	1				III
			CULG				0014.0	0626.0	1				S
			PALE				0046.0	0048.0	1				V
			LEAR				0047.0	0100.0	1				S
			PALE				0058.0	0100.0	1				V
			LEAR				0119.0	0141.0	2				CONT
			PALE				0120.0	0124.0	1				V
			PALE				0206.0	0208.0	1				V
			LEAR				0207.0	0207.0	2				III
			LEAR				0215.0	0931.0	1				CONT
			PALE				0302.0	0308.0	1				S
			LEAR				0303.0	0319.0	3				S
			CULG				0308.0	0309.0	2				III
			PALE				0317.0	0319.0	2				V
			CULG				0318.0	0320.0	3				III
			LEAR				0351.0	0351.0	2				III
			PALE				0356.0	0408.0	1				S
			LEAR				0407.0	0410.0	3				III
	0418	1840	WEIS				0431.6	0441.4	2				IIIGG
			CULG				0432.0	0445.0	3				III
			LEAR				0432.0	0442.0	2				S
			CULG				0449.0	0517.0	3				III
			LEAR				0449.0	0514.0	2				S
			WEIS				0449.2	0450.4	2				IIIG

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Observation Day	Start (UT)	End (UT)	Sta	Decimetric Band Start (UT)	End (UT)	Int (1-3)	Metric Band Start (UT)	End (UT)	Int (1-3)	Dekametric Band Start (UT)	End (UT)	Int (1-3)	Spectral Type
25			SVTO				0454.0	0514.0	2				S
			WEIS	0454.4	0514.8	3							IIIGG
			LEAR				0504.0	0505.0	3				III
			WEIS				0532.0	1044.0	1				I
			WEIS				0533.3	0533.4	1				IIIG
			CULG				0539.0	0611.0	1				I
			SVTO				0648.0	0648.0	1				III
			WEIS				0648.5	0649.5	2				IIIG
			SVTO				0710.0	0711.0	1				III
			WEIS				0717.8	0718.4	1				IIIG
			SVTO				0753.0	0754.0	1				III
			LEAR				0754.0	0755.0	2				III
			WEIS				0754.0	0754.2	2				IIIB
			WEIS				1057.5	1052.7	1				IIIG
			WEIS				1057.5	1057.7	1				IIIG
			WEIS				1102.1	1102.1	1				IIIB
			WEIS				1303.4	1307.5	2				IIIB
			WEIS	1317.2	1322.2	2							IIIG
			SGMR				1319.0	1322.0	1				V
			SGMR				1329.0	1331.0	1				V
			WEIS				1329.2	1330.1	1				IIIG
			SGMR				1507.0	1508.0	1				V
			SVTO				1507.0	1508.0	2				V
			WEIS				1507.4	1508.1	2				IIIG
			WEIS	1527.7	1529.0	3							IIIGG
			WEIS	1534.7	1534.8	2							IIIB
			PALE				1726.0	1727.0	1				III
			WEIS				1726.8	1726.9	2				IIIB
			PALE				1812.0	1812.0	1				III
			PALE				1835.0	1841.0	1				V
			PALE				1908.0	1914.0	1				V
			PALE				1930.0	1931.0	1				V
			SGMR				1930.0	1931.0	1				V
			PALE				1947.0	1959.0	1				S
			PALE				2004.0	2100.0	1				S
			PALE				2108.0	2127.0	1				S
			CULG				2225.0	2303.0	3				III
			PALE				2225.0	2227.0	3				V
			SGMR				2226.0	2227.0	2				V
26			CULG				0034.0	0036.0	3				III
			LEAR				0034.0	0045.0	3				S
			PALE				0034.0	0036.0	3				V
			PALE				0043.0	0044.0	1				V
			CULG				0055.0	0655.0	1				S
			LEAR				0056.0	0100.0	1				III
			PALE				0056.0	0059.0	1				V
			LEAR				0218.0	0226.0	1				III
			PALE				0218.0	0225.0	1				III
			LEAR				0336.0	0338.0	1				V
			LEAR				0446.0	0447.0	1				III
			LEAR				0533.0	0533.0	1				III
			CULG				0545.0	0549.0	2				III
			LEAR				0545.0	0549.0	2				III
			SVTO				0548.0	0548.0	2				III
	0415	0847	WEIS				0548.4	0548.6	2				IIIG
			WEIS				0548.7	0549.1	2				IIIG
			SVTO				0558.0	0558.0	2				III
			CULG				0559.0	0559.0	2				III
			LEAR				0559.0	0600.0	2				III
			SVTO				0645.0	0646.0	1				III
			WEIS				0645.3	0647.7	2				IIIG
			LEAR				0647.0	0649.0	2				III
			LEAR							0653.0	0655.0	1	III
			LEAR				0653.0	0655.0	1				III
	0901	1840	WEIS				0929.0	0929.7	2				IIIG
			WEIS				1053.7	1053.8	2				IIIB
			SGMR				1149.0	1150.0	1				III
			SVTO				1149.0	1149.0	1				III
			WEIS				1149.2	1149.3	2				IIIB

SOLAR RADIO EMISSION SPECTRAL OBSERVATIONS

MAY 1987

Observation Day	Start (UT)	End (UT)	Sta	Decimetric Band Start (UT)	End (UT)	Int (1-3)	Metric Band Start (UT)	End (UT)	Int (1-3)	Dekametric Band Start (UT)	End (UT)	Int (1-3)	Spectral Type
26			SGMR				1236.0	2345.0	1				CONT
			SVTO				1313.0	1315.0	2				V
			SGMR				1314.0	1315.0	2				V
			WEIS				1314.3	1315.3	3				III G
			SVTO				1348.0	1352.0	2				III
			WEIS				1349.7	1349.8	1				III B
			WEIS				1352.6	1352.7	1				III B
			SVTO				1449.0	1449.0	1				III
			WEIS				1648.0	1648.1	1				III B
			WEIS				1659.5	1659.6	1				III B
			WEIS				1701.3	1701.8	2				III G
			SGMR				1719.0	1728.0	2				S
			WEIS				1719.3	1720.7	3				III G
			WEIS				1726.3	1727.2	2				III G
			PALE				1936.0	1937.0	1				V
			PALE				1947.0	1948.0	3				V
			SGMR				1947.0	1948.0	2				V
			PALE				2129.0	2130.0	1				V
			CULG				2131.0	2131.0	1				III
			PALE				2234.0	2236.0	1				V
			CULG				2235.0	2236.0	3				III
			PALE				2302.0	2302.0	1				V
			CULG				2303.0	2303.0	1				III
			CULG				2331.0	2331.0	1				III
			PALE				2331.0	2331.0	1				V
27			LEAR				0009.0	0012.0	2				III
			PALE				0009.0	0011.0	1				V
			CULG				0010.0	0012.0	2				III
			LEAR				0043.0	0049.0	1				III
			PALE				0043.0	0049.0	1				V
			CULG				0044.0	0050.0	1				III
			CULG				0129.0	0142.0	2				III
			LEAR				0129.0	0129.0	2				III
			PALE				0129.0	0142.0	2				S
			LEAR				0135.0	0142.0	2				III
			LEAR				0149.0	0200.0	2				III
			PALE				0154.0	0200.0	1				V
			CULG				0155.0	0200.0	1				III
			CULG							0246.0	0250.0	1	III
			PALE				0301.0	0307.0	1				V
			LEAR				0302.0	0308.0	2				III
			PALE				0336.0	0337.0	1				III
			CULG				0337.0	0528.0	1				S
			LEAR				0337.0	0337.0	1				III
			LEAR				0401.0	0402.0	1				III
			LEAR				0528.0	0529.0	1				III
			SVTO				0609.0	0610.0	2				V
	0417	1510	WEIS				0609.6	0610.3	2				III G,U
			CULG				0610.0	0611.0	2				III
			LEAR				0610.0	0611.0	2				III
			SVTO				0944.0	0944.0	2				III
			SGMR				1217.0	1219.0	2				V
	1535	1842	WEIS										
			SGMR				1617.0	1619.0	2				V
			PALE				2155.0	2208.0	2				S
			SGMR				2159.0	2159.0	1				III
28			LEAR				0006.0	0007.0	2				III
			PALE				0006.0	0007.0	2				V
			LEAR				0026.0	0028.0	2				III
			PALE				0026.0	0028.0	2				III
			LEAR				0043.0	0048.0	3				V
			PALE				0043.0	0052.0	3				V
			LEAR				0052.0	0052.0	2				III
			PALE				0113.0	0125.0	1				III
			LEAR				0114.0	0114.0	2				III
			SVTO				0347.0	0348.0	1				III
	0414	1842	WEIS	0432.9	0433.0	2							III G
			WEIS	0720.2	0720.4	1							III G
			LEAR				0757.0	0759.0	2				III

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

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Observation Day	Start (UT)	End (UT)	Sta	Decimetric Band Start (UT)	End (UT)	Int (1-3)	Metric Band Start (UT)	End (UT)	Int (1-3)	Dekametric Band Start (UT)	End (UT)	Int (1-3)	Spectral Type
28			SVTO				0757.0	0759.0	2				V
			WEIS				0757.8	0757.9	2				III G
			WEIS	0809.3	0809.5	1							III G
			WEIS	0811.0	0811.2	2							III G
			SVTO				1001.0	1011.0	2				S
			WEIS				1002.9	1003.6	1				III G
			WEIS				1011.2	1011.3	1				III B
			SVTO				1034.0	1036.0	1				III
			SVTO				1055.0	1055.0	2				III
			WEIS	1107.1	1107.2	2							III B
			WEIS	1133.6	1134.1	1							III G
			WEIS	1232.2	1232.6	1							III G
			WEIS	1257.6	1301.0	3							III GG
			SVTO				1315.0	1316.0	2				III
			SGMR				1316.0	1317.0	1				V
			WEIS				1316.1	1316.2	1				III G
			WEIS	1333.2	1333.3	2							III B
			SGMR				1359.0	1400.0	1				V
			SVTO				1359.0	1404.0	2				III
			WEIS				1359.3	1359.5	1				III B
			SGMR				1829.0	1830.0	1				V
			SGMR				1859.0	1900.0	1				V
			PALE				1939.0	1944.0	2				V
			SGMR				1944.0	1945.0	1				V
			CULG				2114.0	2115.0	1				S
			CULG				2156.0	2156.0	1				III
			CULG				2308.0	2320.0	1				S
29			CULG				0123.0	0145.0	2				S
			LEAR				0141.0	0146.0	2				V
			LEAR				0313.0	0313.0	1				III
			PALE				0313.0	0314.0	1				III
			CULG				0314.0	0314.0	2				III
			LEAR				0405.0	0405.0	1				III
			PALE				0405.0	0405.0	1				III
			CULG				0406.0	0406.0	2				III
	0415	0636	WEIS										
			SVTO				0655.0	0755.0	2				III
			LEAR				0705.0	0707.0	2				III
			SVTO				0706.0	0706.0	2				III
	0641	1844	WEIS				0706.3	0707.2	2				III G
			LEAR				0755.0	0756.0	2				III
			SVTO				0755.0	0755.0	2				III
			WEIS				0755.6	0755.8	2				III G
			SVTO				0831.0	0842.0	1				S
			WEIS				0841.9	0842.1	2				III B
			SVTO				0848.0	0850.0	3				V
			WEIS	0848.7	0849.7	3							III GG
			LEAR				0849.0	0849.0	3				III
			WEIS	1230.6	1231.5	3							III GG
			WEIS	1233.5	1234.6	2							III G
			SGMR				1250.0	1251.0	1				V
			SVTO				1250.0	1251.0	2				V
			WEIS	1250.2	1251.4	2							III G
			SVTO				1302.0	1308.0	2				V
			WEIS	1450.7	1450.8	2							III B
			SGMR				1502.0	1523.0	1				S
			SVTO				1503.0	1503.0	2				III
			WEIS				1503.2	1503.3	2				III G
			WEIS				1505.4	1507.7	1				III G
			SVTO				1512.0	1513.0	2				III
			SVTO				1512.0	1604.0	2				III
			WEIS	1512.3	1512.8	2							III G
			SGMR				1603.0	1642.0	2				S
			WEIS	1603.3	1604.5	3							III GG
			WEIS	1613.8	1617.2	2							III G
			WEIS	1620.4	1623.7	3							III GG
			PALE				1622.0	1623.0	1				III
			SVTO				1622.0	1625.0	2				V
			PALE				1932.0	2319.0	1				CONT
			PALE				2154.0	2155.0	2				V

SOLAR RADIO EMISSION SPECTRAL OBSERVATIONS

MAY 1987

Observation Day	Start (UT)	End (UT)	Sta	Decimetric Band Start (UT)	End (UT)	Int (1-3)	Metric Band Start (UT)	End (UT)	Int (1-3)	Dekametric Band Start (UT)	End (UT)	Int (1-3)	Spectral Type
29			SGMR				2154.0	2155.0	1				V
			PALE				2349.0	2349.0	1				III
30			LEAR				0027.0	0029.0	1				III
			PALE				0027.0	0030.0	1				III
			LEAR				0115.0	0115.0	1				III
			PALE				0115.0	0115.0	1				III
			LEAR				0227.0	0237.0	1				S
			PALE				0227.0	0237.0	1				S
			SVTO				0735.0	0757.0	3				S
			LEAR				0736.0	0758.0	3				S
	0413	1844	WEIS				0742.2	0742.4	3				IIIG
			WEIS	0752.3	0755.2	3							IIIGG
			PALE				1950.0	1950.0	1				III
			PALE				2149.0	2150.0	1				V
			PALE				2256.0	2257.0	2				V
31	0413	1420	WEIS										
			PALE				0448.0	0448.0	2				III
	1425	1846	WEIS										
			PALE				1925.0	1925.0	1				III
			CULG				2147.0	2150.0	2				III
			CULG				2251.0	2251.0	2				III
			CULG				2257.0	2257.0	2				III

The symbols used under the column heading SPECTRAL TYPE have the following definitions:

B = Single burst
G = Small group (< 10) of bursts
GG = Large group (> 10) of burst
C = Underlying continuum (particularly with Type I)
S = Storm in the sense of intermittent but apparently connected activity
N = Intermittent activity in this period
U = U-shaped burst of Type III

RS = Reverse slope burst
DP = Drifting pairs
DC = Drifting Chains
H = Herringbone
W = Weak
P = Pulsations
CONT = Continuum
UNCLF = Unclassified activity
DCIM = Fast drift

Stations Reporting:

BLEN = Bleien LEAR = Learmonth PALE = Palehua SGMR = Sagamore Hill WEIS = Weissenau
CULG = Culgoora SVTO = San Vito

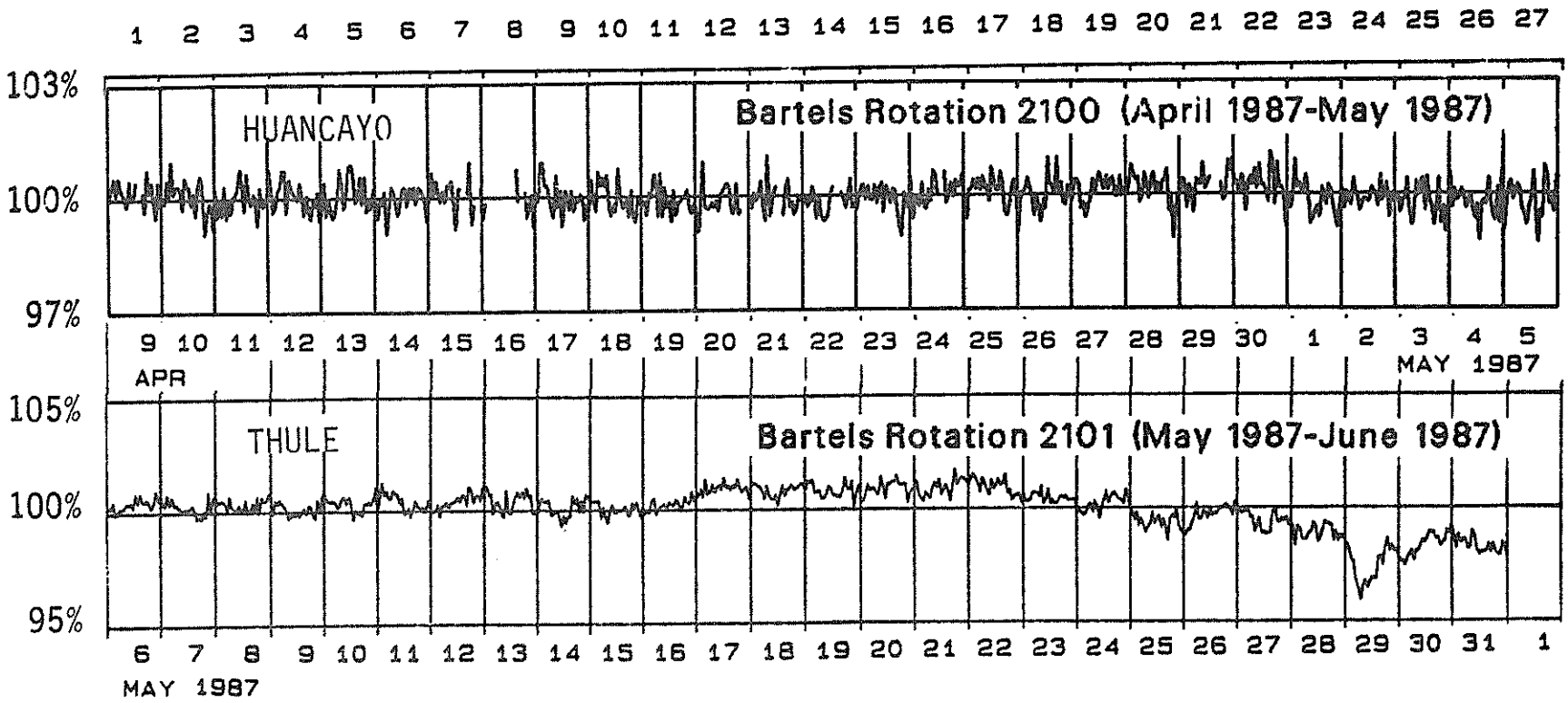
COSMIC RAY INDICES
(Neutron Monitor)

MAY 1987

Day	THULE Average (cts/h)/100	ALERT Average (cts/h)/100	DEEP RIVER Average (cts/h)/300	KIEL Average (cts/h)/100	CLIMAX Average (cts/h)/100	PREDIGTSTUHL Average (cts/h)/100	TOKYO Average (cts/h)/256	HUANCAYO Average (cts/h)/100
1	4579	7480.4	7254.6	6401.3	4262.9		3690.8	1797.5
2	4564	7460.4	7243.6	6408.1	4269.6		3685.2	1798.8
3	4571	7466.4	7245.2	6422.7	4275.8		3690.8	1796.3
4	4576	7474.2	7237.8	6401.6	4259.3		3695.0	1796.3
5	4589	7477.8	7256.2	6398.6	4267.1		---	1796.9
6	4615	7512.6	7270.5	6427.5	4266.8		3696.7	1799.7
7	4607	7496.9	7259.7	6423.2	4275.7		3702.4	1801.5
8	4612	7410.2	7283.6	6427.9	4276.2		3707.7	1803.3(38)
9	4603	7509.5	7267.0	6425.5	4275.5		3710.9	1803.4
10	4611	7508.9	7270.5	6443.7	4287.3		3710.1	1803.6(32)
11	4615	7517.2	7262.9	6449.8	4276.8		3709.7	1804.2
12	4618	7550.9	7280.0	6478.4	4293.2		3703.8	1804.2
13	4614	7540.0	7256.4	6464.4	4277.7		3691.5	1803.4
14	4602	7522.0	7233.0	6436.3	4269.6		3689.5	1803.4
15	4598	7518.0	7234.7	6433.8	4253.6		3686.1	1798.4
16	4608	7535.9	7241.7	6419.1	4273.7		3689.1	1800.5
17	4640	7580.1	7255.2	6437.9	4293.0		3685.3	1803.1
18	4635	7569.7	7285.6	6439.8	4300.1		3692.1	1799.3
19	4634	7562.7	7291.8	6439.2	4308.4		3692.7	1796.8
20	4639	7583.8	7265.3	6457.6	4305.3		3698.8	1801.0
21	4640	7592.0	7244.0	6444.9	4307.4		3698.3	1799.5
22	4640	7585.0	7233.9	6423.4	4287.0		3682.7	1795.2
23	4616	7562.3	7232.1	6416.2	4277.6		3680.3	1795.7
24	4606	7540.4	7216.2	6400.8	4287.1		3686.2	1798.7
25	4568	7474.4	7191.7	6380.1	4277.3		3680.9	1797.6
26	4584	7479.4	7177.4	6383.9	4273.0		3675.3	1800.5
27	4570	7451.3	7160.9	6388.2	4287.4		3687.0	1797.8
28	4546	7425.0	7112.7	6351.5	4226.0		3678.8	1790.3
29	4479	7318.0	7075.5	6283.4	4206.5		3672.2	1789.0
30	4522	7392.0	7107.3	6300.2	4201.8		3672.2	1787.5
31	4518	7366.1	7089.3	6299.0	4197.0		3670.7	1788.2
Mean	4594	7502.0	7227.0	6409.9	4271.0		3690.3	1798.2

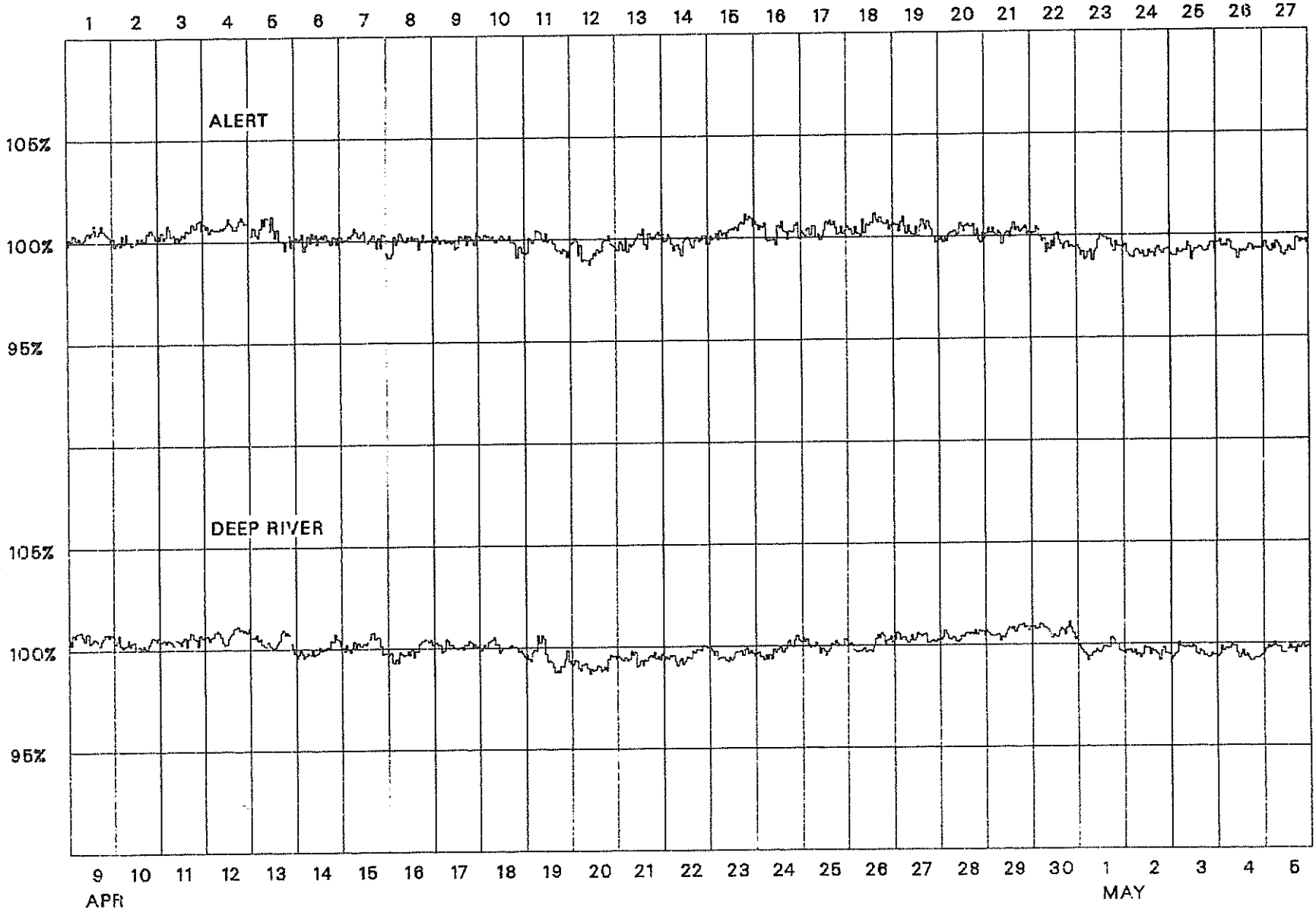
For less than 24-hour coverage, parentheses enclose the number of hours for which data are available.
For Climax and Huancayo, parentheses enclose the number of section hours whenever the sum of both sections falls below 40 hours.

COSMIC RAY INDICES
(Neutron Monitor)



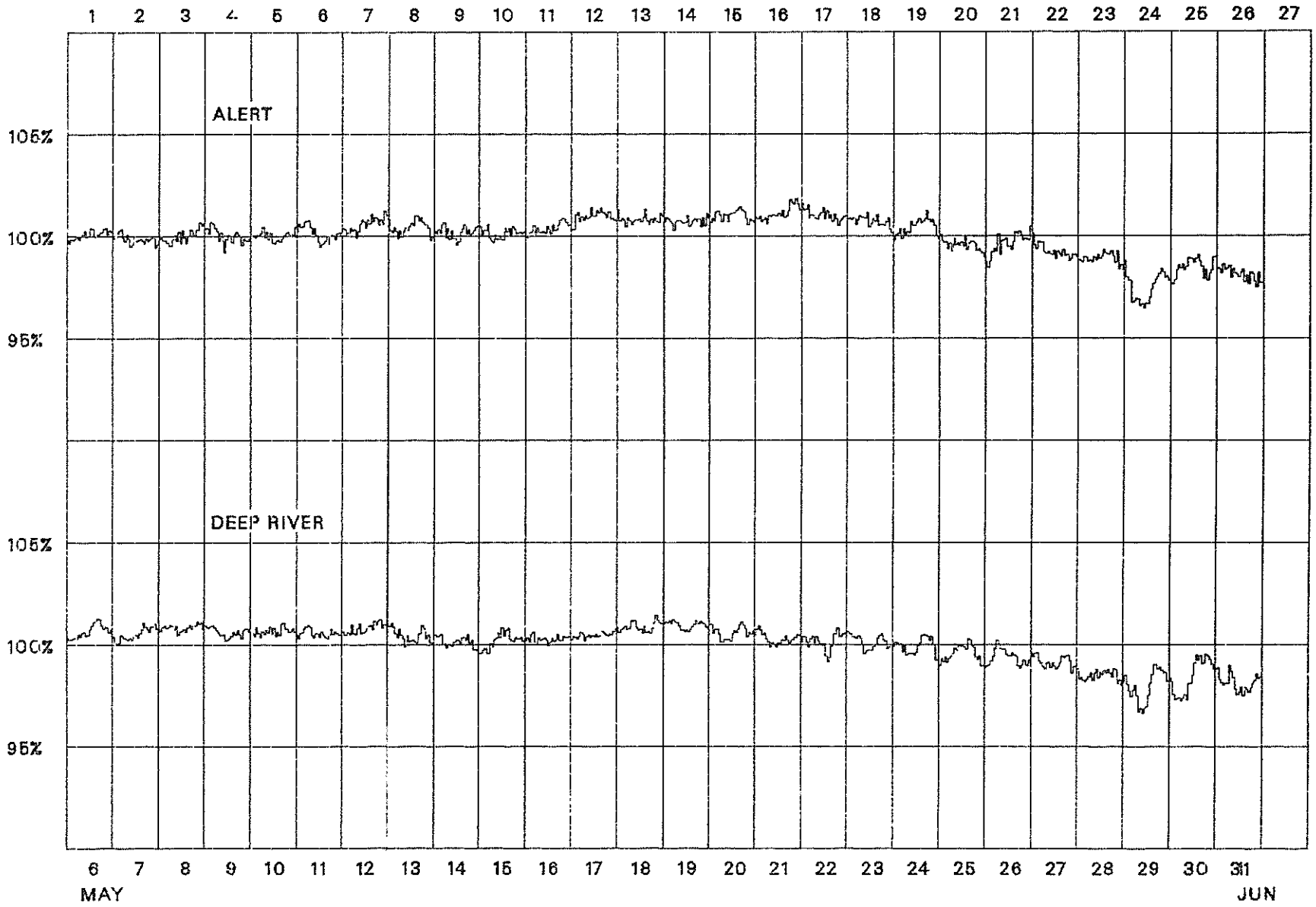
COSMIC RAY INDICES
(Neutron Monitor)

Bartels Rotation 2100 (April 1987-May 1987)



COSMIC RAY INDICES
(Neutron Monitor)

Bartels Rotation 2101 (May 1987-June 1987)



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May 87

GEOMAGNETIC ACTIVITY INDICES

May 1987

Day		Kp Three-Hourly Indices 1	2	3	4	5	6	7	8	Sum	Ap	Cp	Km Three-Hourly Indices 1	2	3	4	5	6	7	8	aa Provisional Am	N	S	M	
1		1-	0+	1+	3	2-	2	2+	3-	14	7	0.4	1-	0+	2-	3-	2	2	2	3-	13	16	7	10	14 CC
2		2-	1	2	2-	1	2-	2-	1+	12	6	0.2	2-	1-	2-	2-	1	1+	1+	2-	9	13	6	10	10 CC
3		1-	1	3-	2+	2+	1+	1+	0+	12	6	0.3	1-	1	3-	3-	2+	1	1+	1-	12	16	10	13	13 KC
4		1	2-	3-	1+	1+	1+	1-	1-	11-	5	0.2	1-	2-	3-	1+	1+	1	1-	1	9	12	7	10	9 CC
5		0+	0+	1-	2-	1+	2	2-	1-	9-	4	0.1	1-	0+	0+	1+	1+	1+	2-	1-	7	12	6	7	12 CC
6		0+	0+	0	0+	1+	2-	3-	3-	9+	5	0.2	0	0+	0	0	1+	2-	2+	3-	8	17	5	5	18 C
7		3-	3+	2	2	1+	1+	1-	1+	15-	8	0.4	3-	3	2+	2+	2-	2-	1	1+	16	19	14	22	11
8	Q6	1	2	1-	1	1-	1	0+	1+	8	4	0.1	1	2	1-	1+	1	1+	0+	1+	7	11	6	9	8 CC
9	Q10	1-	2-	1+	2-	1+	1	1-	1	9+	4	0.2	1-	2-	1+	2	1	1-	1-	1-	8	10	5	10	6 CC
10		1	1+	2	4-	4-	2+	2-	1	17-	10	0.6	1	1+	2+	3	4-	2-	2-	1	18	20	18	18	20
11		2-	1	1	1+	1-	1	2	3-	11+	6	0.3	1+	1	1	1-	0+	1	3-	3-	10	18	8	10	16 KK
12	Q3	1-	1-	0	0	0+	0+	1-	1+	4	2	0.0	1-	0+	0	0+	0+	0+	0+	1+	3	7	4	4	7 CC
13		1-	1	2	1	1+	2	2	3	13	6	0.3	0+	1	2	1	2-	2	2-	3-	12	18	6	9	15 CC
14		3	2-	2	2	3	2	2-	2+	18-	9	0.5	2+	2-	2-	2+	3-	2	2-	2	16	24	12	15	22
15	Q8	0+	1	1+	1+	1+	2-	1-	1-	8+	4	0.1	0+	1	1+	1+	1+	1+	1-	1-	7	9	6	7	8 CK
16	Q9	1-	2-	1	1	1	1	2-	1-	9-	4	0.1	1	2-	1	1	1-	1	1+	1-	7	11	7	10	9 CC
17	Q5	1	1-	0+	1-	1	1	1+	1+	7+	4	0.1	1	0+	0	0+	1-	1-	1	1+	5	10	4	6	9 CC
18	Q1	1-	0+	1-	0+	0+	1-	1-	0+	4	2	0.0	1-	0+	1-	0+	0+	0+	0+	0+	3	7	2	5	5 CC
19	Q2	0+	0+	0+	0+	0+	1	0+	1	4	2	0.0	0+	0+	0+	0	0+	1-	0+	1-	3	7	2	3	6 CC
20	Q7	2-	1-	1	1-	1	1	1-	2-	8+	4	0.1	1+	1-	1	0+	1-	1	1-	1+	6	10	4	8	7 CC
21	Q4	1+	1	0+	0+	0+	1-	1-	0+	5	3	0.1	1	0+	0	0+	0	0+	1-	0+	3	7	2	5	4 CC
22		1-	1+	1	1+	2+	3	2-	2	13+	7	0.3	1-	1	1	1+	2-	3-	2	2	11	21	9	9	22 K
23		2-	2-	2	2-	1+	2	3-	3	16	8	0.4	2	2-	1+	2-	2-	2-	2+	3	15	21	13	12	23
24	D2	2	3+	3-	3-	3-	4	4	5	26+	20	1.0	2-	3+	3-	3+	2+	4-	3+	4+	33	39	37	27	50
25	D1	3	6-	4+	3	4+	3-	4-	1	28-	25	1.2	3	5-	4	4-	3+	2	3-	1	37	41	29	43	28
26		1-	1+	2	2	2	2	4	2	16	9	0.5	0+	2-	2+	2+	2	3-	4-	2+	19	27	14	13	28
27	D4*	3-	3	4-	4-	2+	2	3	3-	23	14	0.8	3-	3	3+	4-	3-	2	3-	3-	27	28	19	28	19
28		2	2-	2-	2	2-	1	3	4+	17+	10	0.6	2	2-	1+	3-	2-	1	2+	4-	18	23	11	13	22
29	D3	3+	5-	4+	5-	4	2-	1+	0+	24+	21	1.1	3+	4+	4	4+	4-	2	1	0+	36	27	42	53	17
30		0+	1-	1+	3-	3+	2+	3	2-	15+	9	0.5	0	0+	2-	3	3+	2	3	2	17	20	19	13	26
31	D5*	2-	2-	2+	3-	2+	3-	4-	3-	20-	11	0.6	1+	2	3-	3	2+	2+	4-	2+	23	20	22	18	25
Mean											8	0.36									13.5	17.5	11.6	14.7	

Day	Kn Three-Hourly Indices 1	2	3	4	5	6	7	8	An	Ks Three-Hourly Indices 1	2	3	4	5	6	7	8	As	S_a	Prov R_I	R_a	R_s	IMF
1	1-	1-	2-	3	3-	3-	3-	3-	17	1-	0	1+	2+	1+	1+	1+	2+	10	79.3	35	36	24	
2	2	1	2-	2	1+	2-	2-	2	12	1	0+	2-	2-	1-	1-	1	1	7	80.2	40	33	25	
3	1-	1+	3-	3-	3-	1+	2-	1	14	1-	1-	2+	2+	2-	1-	1+	0	9	82.8	22	24	27	
4	1	2	3-	2-	2-	1+	1	1+	12	0+	2-	2+	1-	1	1-	1-	1	7	84.4	23	21	29	
5	1-	0+	1-	2	2	2	2-	1+	9	1-	0	0+	1	1	1-	2-	0	5	86.1	22	22	31	
6	0+	0+	0	0+	2-	2+	3-	3-	10	0	0+	0	0	1	1+	2-	3-	7	87.9	27	28	33	
7	3-	3	3-	3-	2-	2	1+	2-	18	3-	3+	2	2+	2-	1+	1-	1+	15	88.1	29	31	33	
8	1+	2-	1-	1+	1	1+	1-	2-	9	1	2	1-	1	1-	1+	0	1	7	89.1	25	22	34	
9	1	2-	2-	2+	2-	1+	1+	1+	11	1-	2-	1+	1+	0+	0	0	0+	4	87.3	23	20	32	
10	1+	1+	3-	3+	4-	2	2	1+	20	1-	1+	2	3	4-	1+	1	0+	16	89.5	25	24	35	
11	2-	1+	1	2-	1-	2-	3-	3-	13	1	1	1-	0	0	0	3-	2+	8	86.4	23	24	31	
12	1-	1-	0	1-	1-	1-	1-	2-	5	0+	0+	0	0	0	0	0+	1+	2	85.4	19	20	30	
13	0+	1	2	2-	2	3-	2	3-	14	0+	1	2-	0+	1+	1	2-	2+	8	87.4	22	16	32	
14	2+	2-	2	3-	3	2+	2	2+	18	3-	1+	1+	2	3-	2-	1+	1+	14	91.2	13	12	36	
15	1-	1	1+	2	2-	2-	1+	1	9	0	1-	1	1-	1+	1-	0	0+	4	93.6	35	33	39	
16	1+	2	1	1+	1+	1+	2	1+	10	1-	2-	1	1	0	1-	1	0+	5	98.2	47	48	44	
17	1	1-	0	1	1+	1+	1+	2	7	1	0+	0	0	0	0+	0+	1-	2	96.7	64	69	42	
18	1+	1-	1	1-	1-	1-	1	1-	5	0	0	0+	0	0	0	0	0	0	98.5	46	64	44	
19	1-	1-	0+	0+	1	1+	1-	1-	5	0	0	0+	0	0	0	0	1-	1	100.1	62	57	46	
20	2-	1	1+	1	2-	1+	1+	1+	10	1-	1-	0+	0	0	0+	0	1	3	99.8	46	42	46	
21	1	1-	0+	0+	0+	1-	1+	1-	5	1	0	0	0	0	0	0	0	1	99.9	41	35	46	
22	1+	1+	1+	2-	3-	3	2	2	15	0	1	1-	1	1-	2-	2	2	8	101.0	35	34	47	
23	2-	2	2	2	2+	2+	2+	3	18	2	1+	1	1+	1	1+	2	3	12	94.9	36	32	40	
24	2-	3	3-	3+	3-	4-	3+	4+	34	2-	3+	3-	4-	2	3+	3+	4+	33	98.5	35	41	44	
25	3-	5-	4	3+	4-	3-	3+	2-	40	3	5-	4	4-	3	2-	2-	0	34	96.8	37	37	43	
26	1-	2	3-	2+	2+	3-	4-	2	20	0	1+	2-	2+	2	3-	3+	3-	17	92.3	34	35	38	
27	2+	3	3+	4-	3-	2+	3	3-	28	3-	3+	3+	4-	3-	1+	2	3-	27	87.5	31	31	32	
28	2+	2	2-	3	2+	1+	3-	4-	22	2-	1+	1+	2	1	1-	2	4	15	85.1	19	24	30	
29	3	4+	4+	4	4-	2	1+	1-	36	4-	5-	4	4+	4-	2-	0+	0	36	79.3	12	14	24	
30	0+	1-	2	3	3	3-	3	2	19	0	0	1+	3	4-	2-	3	2	17	77.9	12	13	22	
31	2	2-	3-	3	3-	3-	3	2	21	1	2	3-	3+	2	2	4	3-	24	77.3	10	11	21	
Mean									15.7									11.5	89.8	30.6	30.7	35.0	

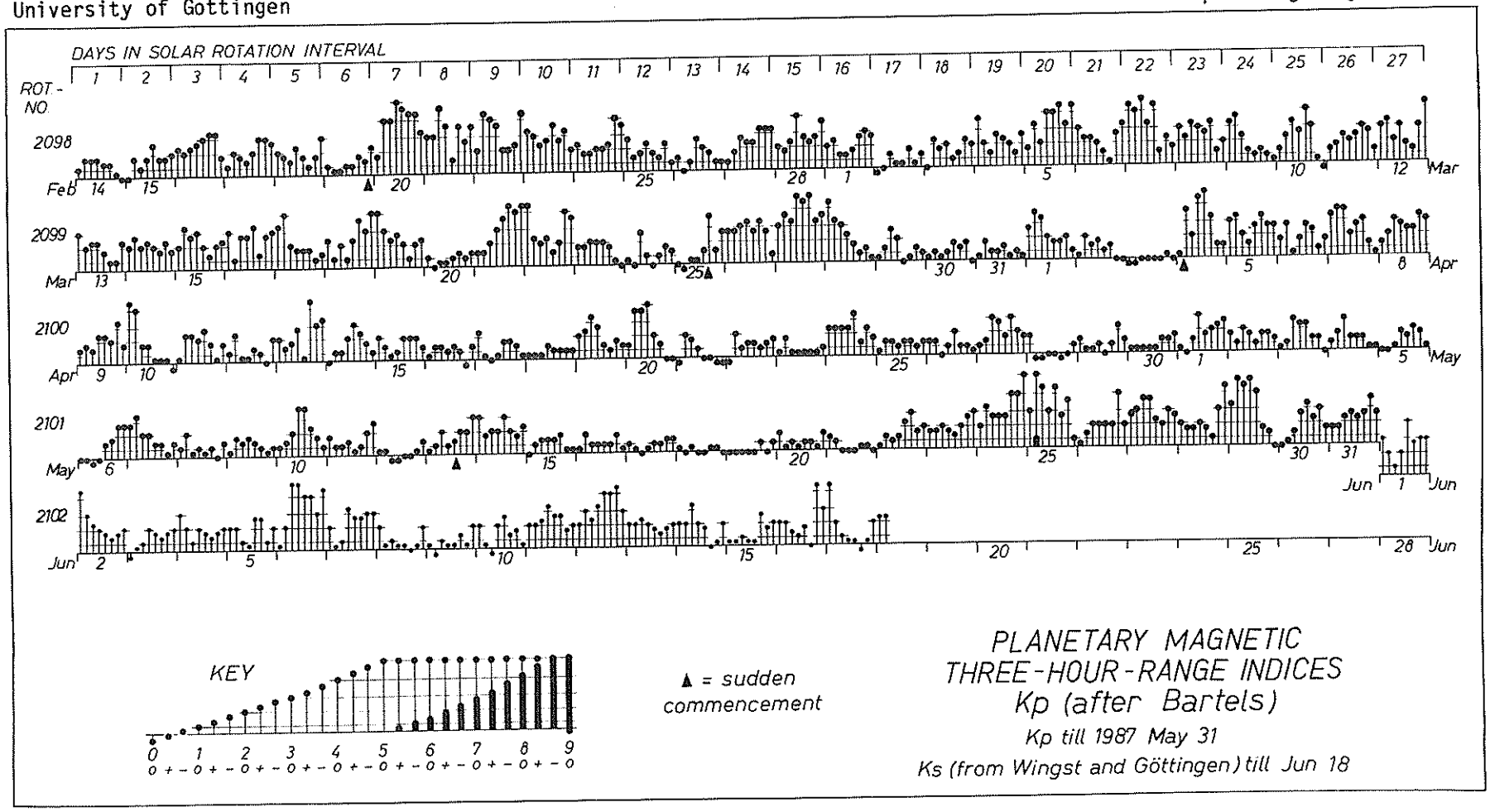
DAILY AVERAGE INDICES Ap

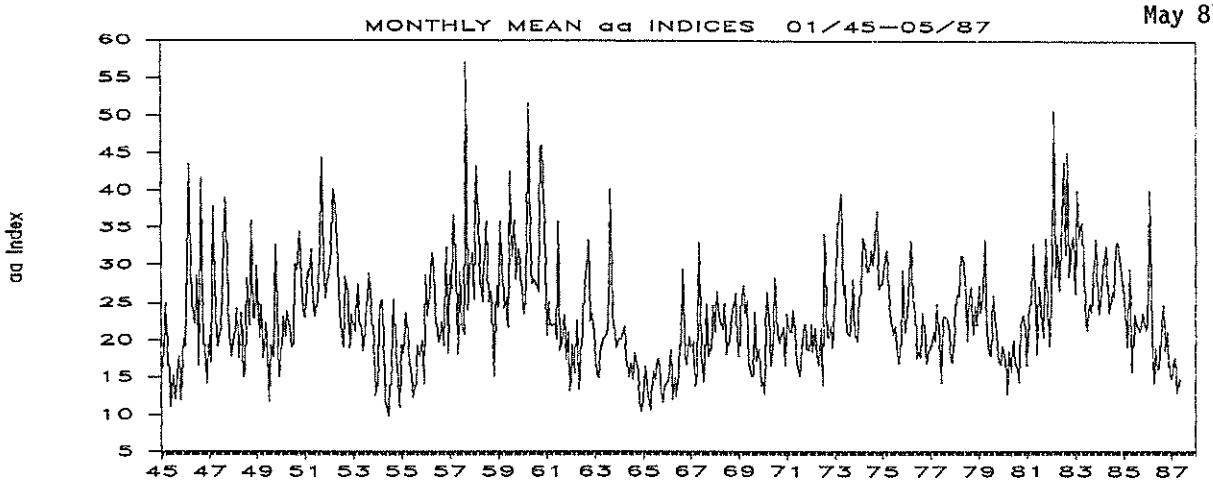
DAY	1986 JUN	JUL	AUG	SEP	OCT	NOV	DEC	1987 JAN	FEB	MAR	APR	MAY
1	15	7	6	9	7	13	13	18	7	9	10	7
2	8	13	5	16	23	6	8	10	4	3	4	6
3	10	8	19	7	9	16	6	6	4	6	2	6
4	7	7	20	7	7	67	7	3	4	10	16	5
5	5	7	9	9	19	20	4	3	4	21	12	4
6	6	5	6	8	12	12	4	3	7	10	7	5
7	12	4	4	5	5	6	6	5	9	21	13	8
8	7	6	7	5	6	4	4	7	14	12	11	4
9	7	6	10	6	6	3	6	10	11	9	8	4
10	13	6	6	6	3	5	12	6	8	11	10	10
11	6	4	7	16	4	14	8	5	7	8	7	6
12	6	6	10	89	2	9	4	10	18	14	5	2
13	6	7	10	22	28	5	12	6	4	8	12	6
14	6	4	5	12	31	5	20	5	5	8	6	9
15	5	4	6	18	14	12	4	5	6	10	6	4
16	5	5	4	7	6	11	12	12	12	12	4	4
17	8	8	5	14	6	8	5	10	9	10	5	4
18	9	6	3	20	13	6	6	8	7	12	4	2
19	5	4	4	21	21	4	6	7	5	11	8	2
20	6	3	15	18	14	5	7	18	29	4	12	4
21	6	6	29	11	11	3	11	10	19	18	3	3
22	8	7	29	4	6	2	14	10	18	15	4	7
23	5	5	25	43	5	12	22	11	14	6	4	8
24	7	15	22	22	2	46	10	7	12	5	9	20
25	3	17	17	26	4	49	11	7	7	6	4	25
26	5	20	12	27	3	17	14	7	6	13	4	9
27	28	16	13	20	16	9	9	7	12	26	9	14
28	18	9	12	13	9	5	3	11	13	12	2	10
29	11	17	22	13	15	10	3	10		5	4	21
30	9	11	27	5	14	14	4	4		4	4	9
31		12	16		6		7	8		4		11
MEAN	8	8	12	17	11	13	8	8	10	10	7	8

PLANETARY 3-HOUR-RANGE INDICES (Kp) BY 27-DAY SOLAR ROTATION INTERVAL

University of Gottingen

Kp through May 31, 1987





Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Mean
1945	16.1	16.4	25.0	19.1	15.4	11.1	15.3	12.1	15.6	17.9	12.0	20.2	16.3
1946	19.2	30.2	43.5	25.0	24.1	22.3	28.6	16.7	41.7	19.6	19.3	14.3	25.4
1947	20.6	17.1	37.9	23.3	19.1	21.1	21.4	32.9	39.1	31.3	20.7	17.9	25.2
1948	20.8	21.0	24.2	17.7	23.7	15.0	16.2	28.3	22.0	36.1	23.1	23.0	22.6
1949	29.8	20.4	24.7	17.6	22.4	17.9	11.8	19.2	17.8	32.7	24.6	15.1	21.2
1950	19.5	23.2	20.6	23.8	21.7	19.0	19.5	30.2	29.3	34.5	28.0	24.0	24.4
1951	23.1	29.2	28.5	32.1	25.5	23.2	25.2	29.7	44.4	30.3	25.7	28.2	28.8
1952	28.5	34.3	40.1	38.0	33.1	23.8	20.7	19.0	28.5	26.4	18.9	23.4	27.9
1953	22.3	21.2	27.4	22.7	21.4	18.4	22.5	26.1	29.0	22.4	20.2	12.6	22.2
1954	13.9	24.5	25.5	20.6	12.0	9.7	13.1	16.5	25.4	21.1	14.5	10.9	17.3
1955	19.3	18.2	23.6	21.1	16.7	15.1	12.3	14.3	19.1	17.8	19.9	14.1	17.6
1956	28.7	23.3	27.6	31.7	29.3	23.5	19.8	20.7	22.4	19.3	32.3	18.2	24.7
1957	28.7	26.8	36.7	28.8	18.1	29.1	21.7	20.7	57.0	24.0	29.5	31.7	29.4
1958	25.5	43.2	36.1	27.6	25.2	29.7	36.0	25.1	26.5	24.7	15.0	27.2	28.5
1959	24.3	35.9	29.9	24.2	25.7	21.6	42.5	31.2	36.1	28.2	32.1	30.8	30.2
1960	25.2	23.5	27.6	51.5	31.6	27.6	28.1	27.2	26.4	45.6	45.9	34.5	32.9
1961	20.6	25.1	22.0	21.8	22.3	20.1	36.0	18.5	20.7	23.3	17.3	21.1	22.4
1962	13.2	19.2	15.5	22.6	13.4	18.1	21.0	26.2	29.8	33.3	22.5	23.5	21.5
1963	19.3	15.3	14.9	18.2	20.4	20.5	20.8	22.5	40.2	23.5	20.7	18.9	21.3
1964	20.1	20.1	21.0	21.7	17.5	15.1	16.9	14.8	18.2	16.9	13.8	10.3	17.2
1965	11.8	16.3	14.3	12.6	10.5	15.7	14.7	16.8	17.5	13.1	11.7	13.8	14.1
1966	14.2	14.8	18.6	12.0	14.8	12.5	17.1	20.0	29.4	17.5	16.8	20.5	17.3
1967	18.9	19.8	13.8	15.5	33.1	18.6	14.4	17.5	24.7	17.8	18.9	24.5	19.8
1968	21.1	26.5	23.3	22.2	21.4	24.9	18.0	20.1	22.0	24.8	26.2	20.3	22.6
1969	17.8	25.8	27.3	23.6	25.2	16.7	15.0	15.3	23.8	17.2	18.7	13.8	20.0
1970	14.4	12.7	26.4	23.1	16.6	18.3	28.4	21.0	19.7	20.6	21.6	16.5	19.9
1971	23.5	21.2	21.1	23.9	21.1	17.0	15.2	17.1	21.4	22.2	18.8	18.6	20.1
1972	21.9	18.3	21.5	18.1	16.6	21.5	14.0	34.2	20.4	20.4	21.8	18.9	20.6
1973	26.1	32.7	36.9	39.6	26.1	27.3	20.9	20.6	22.8	28.2	20.7	19.9	26.8
1974	25.8	26.4	33.7	32.9	29.2	29.2	32.0	30.2	33.7	37.3	26.8	27.5	30.4
1975	27.6	31.1	32.0	24.3	22.7	20.7	21.7	18.1	16.9	20.2	29.3	21.1	23.8
1976	23.3	28.5	33.4	25.4	23.7	17.5	18.4	17.7	23.7	20.4	16.9	18.6	22.3
1977	18.7	21.0	19.9	24.9	20.1	14.2	22.9	23.2	23.0	20.9	17.3	17.0	20.3
1978	24.6	26.2	25.9	31.3	31.2	28.3	19.9	25.6	27.0	20.8	24.6	22.0	25.6
1979	27.3	23.7	26.9	33.5	21.0	18.3	17.9	26.0	22.0	19.3	17.1	16.8	22.5
1980	19.0	17.3	12.7	18.4	15.6	20.0	17.0	15.9	14.2	21.9	23.3	21.7	18.1
1981	16.5	23.1	26.6	32.8	26.9	18.0	27.2	24.0	20.4	33.7	24.1	19.3	24.4
1982	24.2	50.6	28.5	32.9	26.7	32.1	43.9	31.4	45.1	28.5	33.0	33.8	34.2
1983	26.2	40.0	33.6	35.7	31.6	24.9	21.3	24.9	23.7	28.3	33.5	26.0	29.1
1984	23.5	26.7	30.7	32.5	27.2	23.7	26.4	25.8	32.6	33.1	31.0	29.0	28.5
1985	25.7	24.1	19.0	29.5	15.6	19.9	23.4	22.0	21.2	22.2	23.7	21.4	22.3
1986	22.4	40.0	21.1	14.3	18.8	15.9	16.3	22.3	24.7	18.6	21.2	15.3	20.9
1987	14.8	16.6	17.6	12.9	14.7								15.3

PRINCIPAL MAGNETIC STORMS

MAY 1987

Sta	Geomag Lat	Commencement Day	Commencement Time (UT)	Type	SC Amplitudes D (Min)	SC Amplitudes H (Gamma)	SC Amplitudes Z (Gamma)	Maximum 3-Hour K Index Day(3-Hour Periods)	K	Ranges D (Min)	Ranges H (Gamma)	Ranges Z (Gamma)	End Day	End Hour (UT)
KRC	16.4N	13	1405	SC	- 1	17	10	14(4)	4	4	63	15	15	01
HYB	07.6N	13	1404	SC	- 0.2	13	- 1	14(5)	4	5	69	11	14	23
HYB	07.6N	22	1000	..	..	..	..	22(5,6,8) 23(7,8)	3	4	79	20	23	23
ETT	16.4N	23	2000	..	..	..	..		-	-6	151	79	25	22
FRD	49.6N	24	----	..	..	..	..	25(2)	5	21	125	67	26	--
JAI	17.3N	24	0800	..	..	..	..		-	9	98	42	28	03
SHL	14.7N	24	0800	..	..	..	..		-	7	111	36	28	03
UJJ	13.5N	24	0800	..	..	..	..		-	8	105	40	28	03
ABG	09.5N	24	0800	..	..	..	..	24(8) 25(2)	5	8	113	62	28	03
HYB	07.6N	24	0300	..	..	..	..	24(8) 25(2,3,5)	5	7	91	32	25	22
TRD	01.1S	24	0800	..	..	..	..		-	7	163	103	28	03
GUA	04.0N	25	0238	..	..	..	..	25(4)	5	--	120	20	25	22
HYB	07.6N	26	0300	..	..	..	..	27(4)	5	5	125	32	28	03
COL	64.6N	28	18--	..	..	..	..	29(3,4)	7	257	1670	810	29	18
FRD	49.6N	28	----	..	..	..	..	29(4)	5	14	88	70	30	--
HYB	07.6N	28	0900	..	..	..	..	29(4,5)	5	5	104	19	29	21
SIT	60.0N	29	02--	..	..	..	..	29(3)	7	--	--	700	29	15
HYB	07.6N	30	0700	..	..	..	..	30(5) 31(7)	4	6	86	22	31	23

Stations Reporting:

ABG = ALIBAG
BJI = BEIJING
COL = COLLEGE
ETT = ETAIYAPURAM
FRD = FREDERICKSBURG
GNA = GNANGARA
GUA = GUAM
HER = HERMANUS
HYB = HYDERABAD
JAI = JAIPUR
KRC = KARACHI
PMG = PORT MORESBY
SHL = SHILLONG
SIT = SITKA
TRD = TRIVANDRUM
UJJ = UJJAIN
WIT = WITTEVEEN

RADIO PROPAGATION QUALITY INDICES

MAY 1987

Day	Bracknell	Teheran	New York	Tokyo	Johannesburg	Canberra
	For Circuits from Norddeich to:					
1	5.9	5.5	7.2	6.6	3.9	7.1
2	5.5	5.0	5.7	7.0	3.1	6.0
3	6.4	6.4	6.5	8.1	4.8	6.7
4	6.5	6.8	5.4	7.6	8.4	6.5
5	6.4	6.5	7.4	8.0	8.7	6.6
6	6.0	6.3	7.6	7.4	8.7	7.1
7	6.2	5.8	6.1	7.2	6.5	7.0
8	5.9	5.6	6.5	6.8	8.3	6.5
9	6.3	6.4	6.3	7.3	8.2	6.9
10	6.4	6.6	6.5	7.5	7.2	6.6
11	6.8	6.3	7.2	7.6	8.0	6.5
12	5.8	6.0	6.8	7.2	8.5	6.7
13	6.3	6.5	7.5	7.5	8.1	7.3
14	5.3	5.9	5.8	6.8	8.3	6.5
15	5.6	5.7	6.5	6.8	8.9	6.5
16	6.0	5.7	7.0	6.7	8.2	6.9
17	6.5	6.0	6.4	8.0	8.3	6.4
18	6.7	5.8	7.0	8.2	8.5	7.1
19	7.1	5.3	7.1	8.5	8.2	7.4
20	6.6	5.4	6.9	7.9	7.8	7.0
21	6.2	5.2	6.2	7.9	7.4	7.7
22	6.6	4.8	7.0	8.3	6.4	7.0
23	7.0	4.2	6.6	7.1	7.3	7.3
24	5.3	4.7	4.6	4.1	5.4	5.8
25	4.5	3.5	3.3	4.9	4.8	4.8
26	4.9	4.2	4.4	4.4	8.0	5.6
27	5.0	3.4	3.2	3.1	4.0	3.4
28	6.7	0.0	5.3	3.8	5.5	3.0
29	5.1	3.9	2.5	2.5	5.1	4.0
30	4.7	5.2	4.4	4.4	5.4	3.8
31	5.6	3.8	3.9	4.4	4.2	3.5
Mean	6.0	5.4	6.0	6.6	6.9	6.2

CALCULATION OF QUALITY INDICES (Q)

From all 24 hourly field strength values and from all frequencies of the same circuit a median field strength value is calculated (FD). This daily value is compared with the average value (FA) of the preceeding 27 days (1 sun rotation).

$$Q = 6.0 + 20 \log(FD/FA)/3.0$$

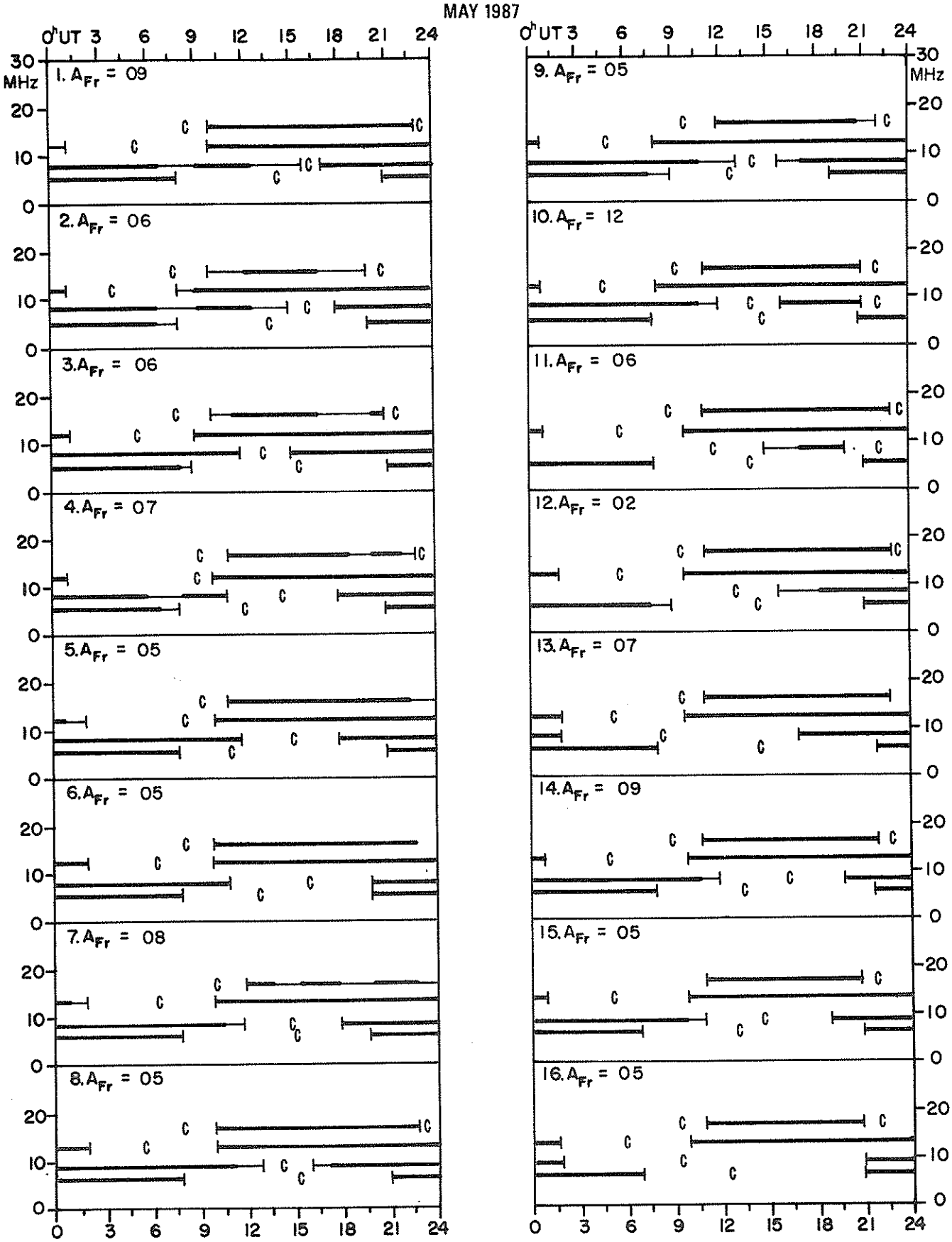
The quality indices vary from 0.0 to 9.9 where 6.0 is normal. Conditions are "normal" (index = 6.0), if they correspond to the average of the preceeding 27 days.

SCALE FOR QUALITY INDICES

0.0 - 1.0 = very poor
1.1 - 3.0 = poor
3.1 - 5.0 = fair
5.1 - 7.0 - normal
7.1 - 9.0 = good
9.1 - 9.9 = very good

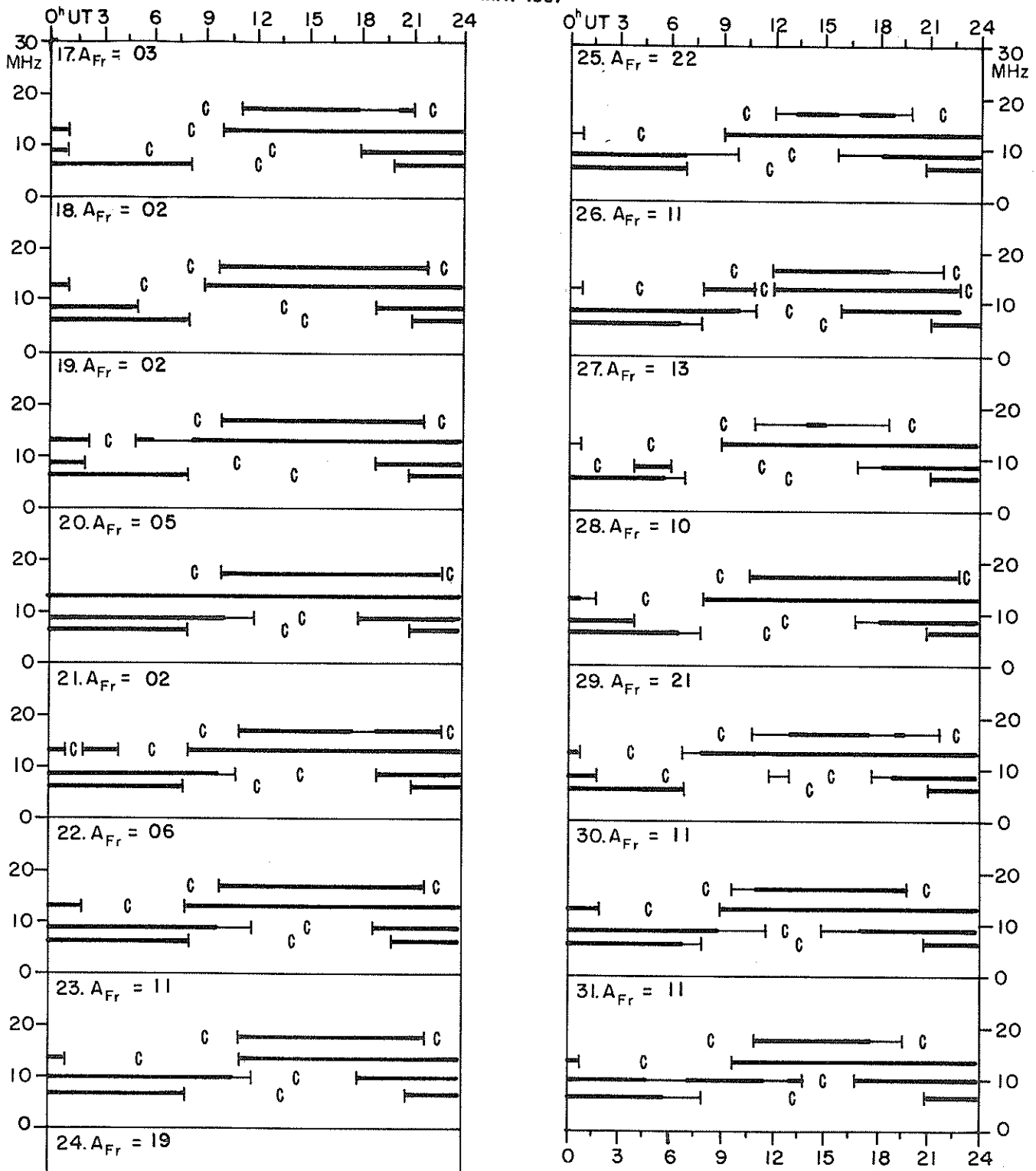
TRANSMISSION FREQUENCY RANGES -- NORTH ATLANTIC PATH

MAY 1987



TRANSMISSION FREQUENCY RANGES -- NORTH ATLANTIC PATH

MAY 1987



Field strengths from four frequencies, 6.4, 8.6, 13.0, and 17.0 MHz, observed on a Norddeich-New York circuit are represented above. Heavy solid lines represent field strengths ≥ -12 dB above 1 μV/m (transmitter power reduced to 1 kW). Observed field strengths between -12 dB and -40 dB above 1 μV/m are represented by the fine line.

C O N T E N T S

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Late
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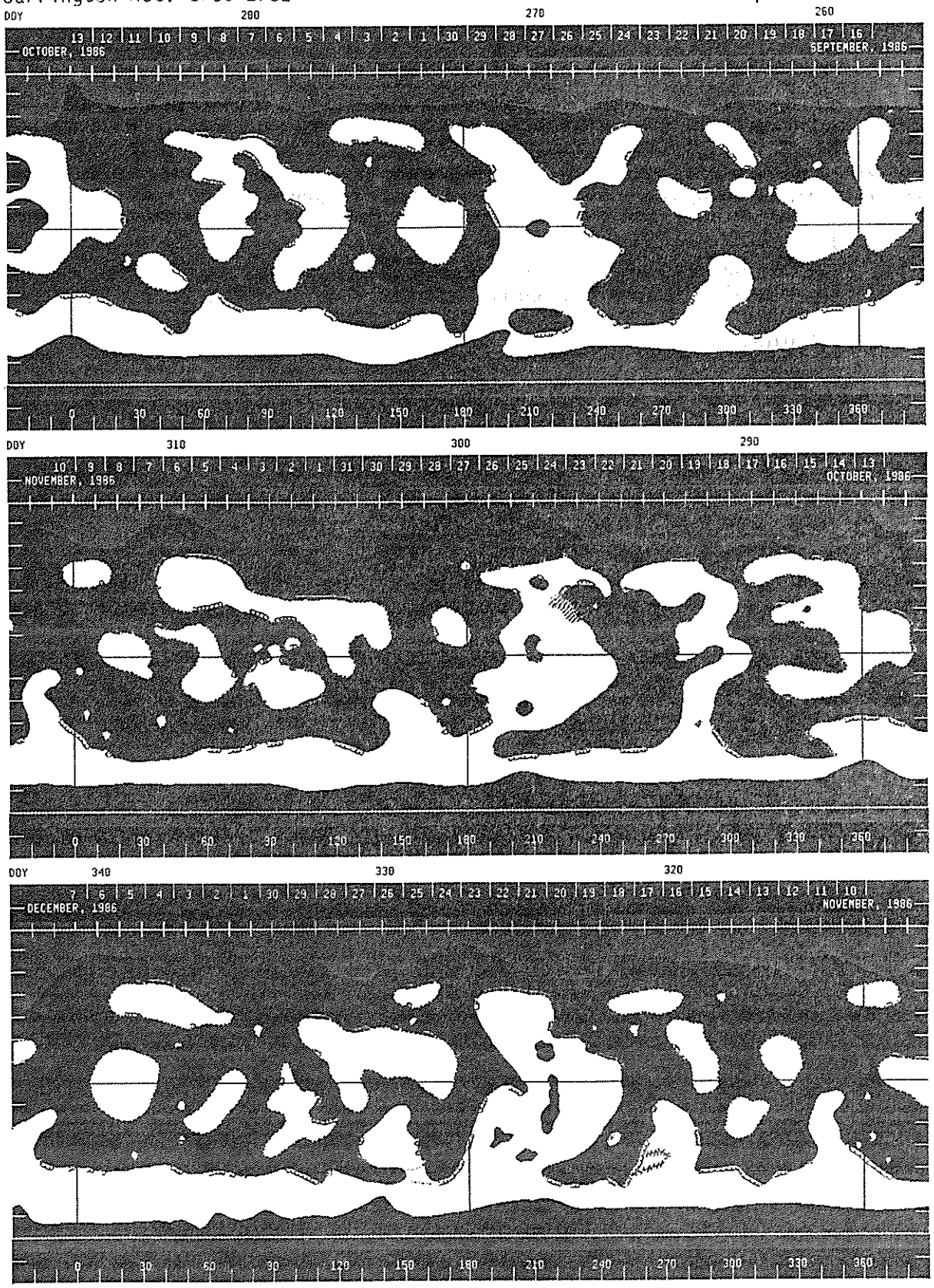
SHADED H-ALPHA SOLAR SYNOPTIC CHARTS

Carrington Rot. 1780-1782

16 Sep to 7 Dec 1986



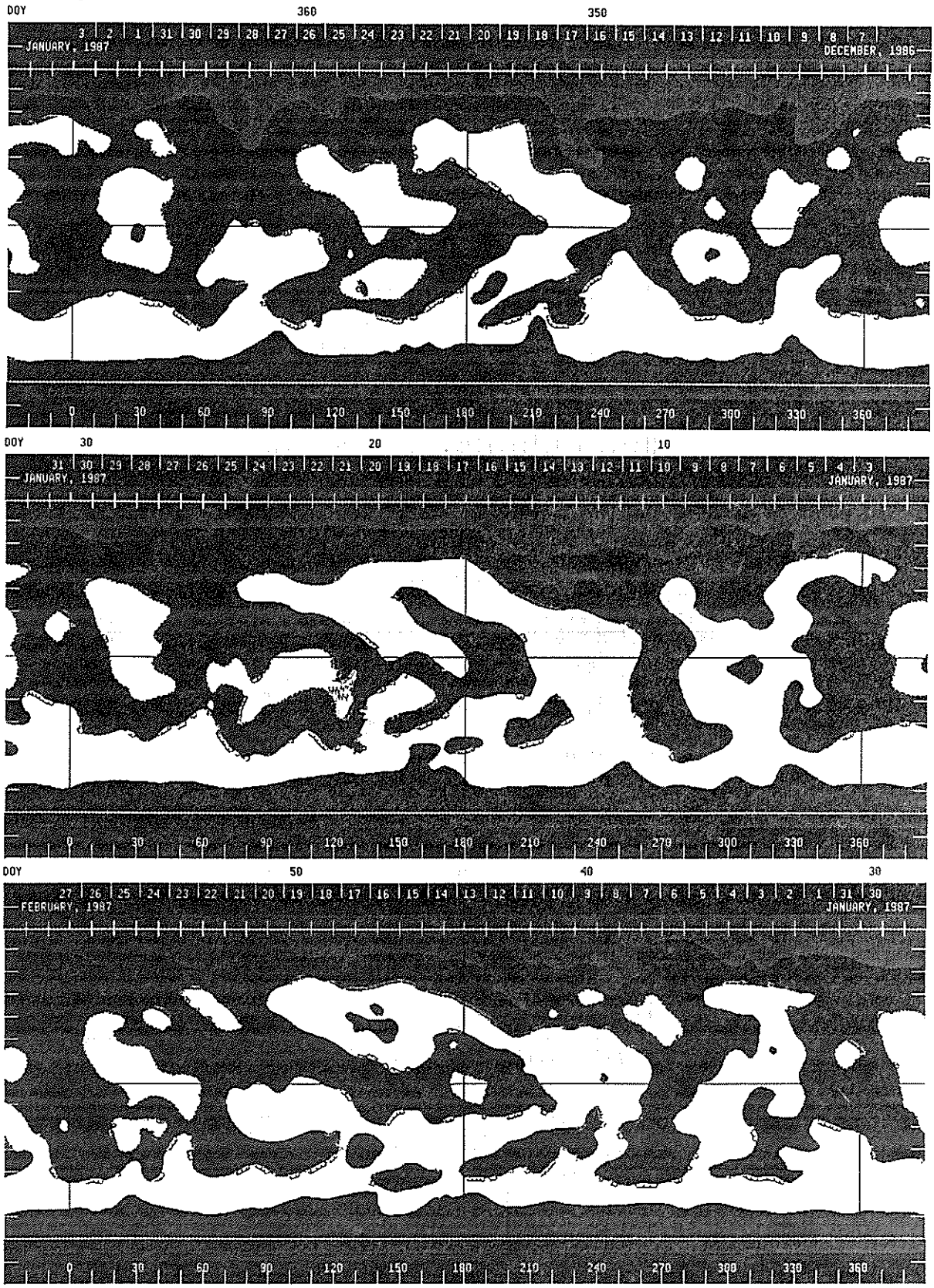
□ = Positive Polarity ■ = Negative Polarity ■ = 10830 Coronal Hole Estimate

Heliographic Longitude

SHADED H-ALPHA SOLAR SYNOPTIC CHARTS

Carrington Rot. 1783-1785

7 Dec 1986 to 27 Feb 1987

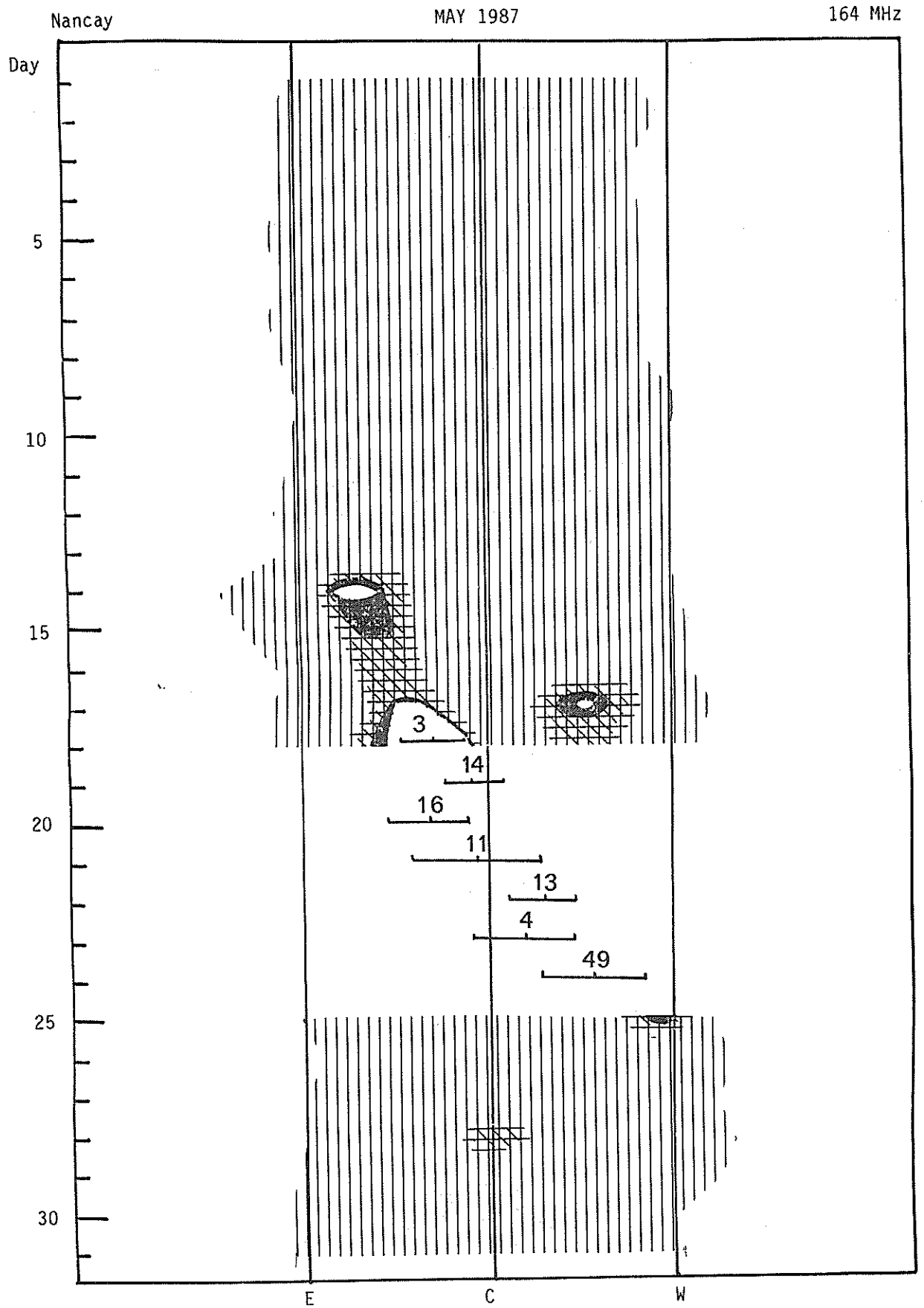


□ = *Positive Polarity* ■ = *Negative Polarity* ■ = *10830 Coronal Hole Estimate*

Heliographic Longitude

102
Late
May 87

SOLAR INTERFEROMETRIC OBSERVATIONS



SOLAR RADIO EMISSION SPECTRAL OBSERVATIONS

APRIL 1986

Day	Observation Start (UT)	Observation End (UT)	Sta	Decimetric Band Start (UT)	Decimetric Band End (UT)	Decimetric Band Int (1-3)	Metric Band Start (UT)	Metric Band End (UT)	Metric Band Int (1-3)	Dekametric Band Start (UT)	Dekametric Band End (UT)	Dekametric Band Int (1-3)	Spectral Type
01	0000	0736	CULG										
	2036	2400	CULG										
02	0000	0735	CULG										
	2035	2400	CULG										
03	0000	0735	CULG										
	2035	2400	CULG										
04	0000	0459	CULG										
	2035	2400	CULG				2222.5	2223.0					III G,W
05	0000	0734	CULG										
	2034	2400	CULG										
06	0000	0734	CULG				0712.5	0713.0	1				III B
			CULG				0714.5	0715.0	1				III B
	2034	2400	CULG										
07	0000	0734	CULG				0325.5	0326.5					III G,W
			CULG				0328.0	0337.0	3				II H
	2034	2400	CULG										
08	0000	0733	CULG				0142.5	0143.0	1				III G
	2033	2400	CULG										
09	0000	0733	CULG										
	2033	2400	CULG										
10	0000	0733	CULG										
	2035	2400	CULG										
11	0000	0733	CULG										
	2033	2400	CULG										
12	0000	0732	CULG										
	2032	2400	CULG										
13	0000	0732	CULG										
	2032	2400	CULG				2035.0	2335.0	1				IS
14	0000	0634	CULG										
	2030	2400	CULG										
15	0000	0730	CULG										
	2030	2400	CULG										
16	0000	0730	CULG										
	2030	2400	CULG										
17	0000	0730	CULG										
	2333	2400	CULG										
18	0000	0730	CULG										
	2150	2400	CULG										
19	0000	0730	CULG										
	2030	2400	CULG										
20	0000	0730	CULG										
	2032	2400	CULG	2118.0		1	2118.0	2118.5	2				III G,U
21	0000	0730	CULG										
	2030	2400	CULG										
22	0000	0730	CULG				0429.5		1				III B
	2030	2400	CULG				2206.0						III B,W
23	0000	0730	CULG										
	2030	2400	CULG				2035.0	2400.0	1				IS
			CULG	2049.0	2338.0	1							IN

SOLAR RADIO EMISSION SPECTRAL OBSERVATIONS

APRIL 1986

Day	Observation Start (UT)	Observation End (UT)	Sta	Decimetric Band Start (UT)	Decimetric Band End (UT)	Decimetric Band Int (1-3)	Metric Band Start (UT)	Metric Band End (UT)	Metric Band Int (1-3)	Dekametric Band Start (UT)	Dekametric Band End (UT)	Dekametric Band Int (1-3)	Spectral Type
23			CULG				2059.5	2400.0	1				IIIN
24			CULG				0000.0	0728.5	1				IS
	0000	0730	CULG				0000.0	0730.0	1				IIIN
			CULG	0001.0	0724.5	1							IN
			CULG				0624.0	0624.5	3				IIIG
			CULG				0653.5	0654.0	3				IIIB
	2030	2400	CULG				2038.0	2400.0	1				IS
			CULG	2047.5	2050.5	1							IN
			CULG				2103.5	2104.0	1				IIIG
			CULG				2128.0		1				IIIB
25	0000	0730	CULG				0000.0	0134.0	1				IS
			CULG				0503.0		3				IIIB,V
			CULG				2055.0	2327.0					IIIN,W
	2031	2400	CULG	2103.0	2400.0		2038.5	2351.0					IS,W
			CULG	2123.0	2323.5	1							IIIG
			CULG	2326.0		1	2326.0		1				IIIG
26	0000	0730	CULG	0000.0	0501.5	1							IN
			CULG	0019.5		1							IIIB
			CULG				0023.0	0213.0					IN,W
			CULG	0254.5	0255.0	2							IIIG
			CULG	0258.5		1							IIIG
			CULG	0406.0	0406.5	1							IIIG
			CULG	0410.0	0410.5	1							IIIG
			CULG	0501.5	0724.0	1							IS
			CULG	0653.5	0654.0	2	0654.0		1				IIIG
			CULG				0704.5		1				IIIB
	2030	2400	CULG	2039.0	2322.5	1	2034.0	2200.0	1				IS
			CULG				2039.5	2146.0					IIIS,W
			CULG				2200.0	2305.0	2				IS,C,DC
			CULG				2305.0	2400.0	1				IS,DC
			CULG	2322.5	2400.0	1							IN
27			CULG	0000.0	0013.0	1							IN
	0000	0730	CULG				0000.0	0722.5	1				IS,DC
			CULG	0013.0	0721.0	1							IS
			CULG				0406.0		1				IIIB,U
	2030	2400	CULG				2038.0	2239.0					IIIS,W
			CULG	2043.5	2400.0								IS,W
			CULG	2120.5	2121.0	2							IIIG
			CULG				2326.0	2328.5					IIIG,W
28	0000	0730	CULG				0000.0	0730.0	1				IIIN
			CULG	0045.5	0606.0		0139.5	0720.5	1				IN
	2030	2400	CULG				2035.3	2400.0	1				IS
29	0000	0730	CULG				0000.0	0719.0	1				IS
			CULG	0420.5	0428.0	1							IN
	2320	2400	CULG										
30	0000	0700	CULG				0124.0	0125.0	1				IIIG

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

MAY 1986

Day	Observation Start (UT)	Observation End (UT)	Sta	Decimetric Band Start (UT)	Decimetric Band End (UT)	Decimetric Band Int (1-3)	Metric Band Start (UT)	Metric Band End (UT)	Metric Band Int (1-3)	Dekametric Band Start (UT)	Dekametric Band End (UT)	Dekametric Band Int (1-3)	Spectral Type
01	0100	0729	CULG				0124.5						IIIB,W
	2029	2400	CULG										
02	0000	0729	CULG	0427.5	0431.5								IN,W
	2029	2400	CULG										
03	0000	0729	CULG	0621.0	0638.0	1							IS
	2029	2400	CULG				2108.5	2109.0	1				IIIG
04	0000	0615	CULG										
	2030	2400	CULG										
05	0000	0730	CULG										
	2030	2400	CULG										
06	0000	0728	CULG										
	2028	2400	CULG										
07	0000	0728	CULG										
	2028	2400	CULG										
08	0000	0728	CULG										
	2028	2400	CULG										
09	0000	0728	CULG										
	2028	2400	CULG										
10	0000	0728	CULG										
	2028	2400	CULG										
11	0000	0728	CULG				0049.0	0053.0	1				IIIG
			CULG				0246.5	0304.0					IIIN,W
			CULG				0255.0	0255.5	1				IIIG
			CULG				0304.0	0304.5	1				IIIG,U
			CULG				0440.0		1				IIIB,V
			CULG				0527.5	0528.0	2				IIIG,U
			CULG				0533.0	0534.0	2				IIIG,U,V
			CULG				0536.0	0537.0	1				IIIG
			CULG				0650.5	0652.0	3				IIIG,U,V
	2028	2400	CULG				2124.5	2125.0	1				IIIB,U
			CULG				2252.5	2254.0	1				IIIG
12	0000	0728	CULG				0002.0		1				IIIB,U
			CULG				0426.0	0426.5	1				IIIB,U
			CULG				0704.0	0704.5					IIIG,U,W
	2028	2400	CULG										
13	0000	0728	CULG				0133.0	0133.5	1				IIIG,U
			CULG				0158.0	0158.5	1				IIIG,U
			CULG				0307.0	0307.5	1				IIIG
	2028	2400	CULG										
14	0000	0728	CULG										
	2028	2400	CULG										
15	0000	0730	CULG										
	2030	2400	CULG				2242.0		1				IIIB
16	0000	0728	CULG										
	2028	2400	CULG										
17	0000	0728	CULG	0110.0	0111.5	1	0110.5	0111.5	1				IIIG
	2028	2400	CULG				2118.5		1				IIIG
18	0000	0728	CULG				0646.0		2				IIIB
	2028	2400	CULG										
19	0000	0728	CULG										
	2028	2400	CULG										
20	0000	0705	CULG										

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

MAY 1986

Day	Observation Start (UT)	Observation End (UT)	Sta	Decimetric Band Start (UT)	Decimetric Band End (UT)	Decimetric Band Int (1-3)	Metric Band Start (UT)	Metric Band End (UT)	Metric Band Int (1-3)	Dekametric Band Start (UT)	Dekametric Band End (UT)	Dekametric Band Int (1-3)	Spectral Type
20	2030	2400	CULG										
			CULG				2055.0	2056.0	2				III G
			CULG				2101.5		3				III B
			CULG				2104.5		2				III B
21	0000	0728	CULG				0143.5	0144.5	2				III G,V
			CULG				0145.0	0146.5	2				III G,V
			CULG				0403.5		2				III B
			CULG				0412.5	0414.0	2				III G,U
			CULG				0604.0	0604.5	2				III G
	2028	2400	CULG										
22	0000	0728	CULG										
	2028	2400	CULG										
23	0000	0728	CULG										
	2028	2400	CULG										
24	0000	0728	CULG	0533.0		1							DCIM
	2028	2400	CULG										
25	0000	0727	CULG										
	2030	2400	CULG	2159.0		1							III G
26	0000	0729	CULG										
	2029	2400	CULG										
27	0000	0729	CULG										
	2029	2400	CULG										
28	0000	0729	CULG										
	2029	2400	CULG										
29	0000	0729	CULG	0131.0		1	0131.0		1				III B
	2029	2400	CULG										
30	0000	0929	CULG										
	2029	2400	CULG										
31	0000	0729	CULG										
	2030	2400	CULG										

SOLAR RADIO EMISSION SPECTRAL OBSERVATIONS

JUNE 1986

Day	Observation Start (UT)	Observation End (UT)	Sta	Decimetric Band Start (UT)	Decimetric Band End (UT)	Decimetric Band Int (1-3)	Metric Band Start (UT)	Metric Band End (UT)	Metric Band Int (1-3)	Dekametric Band Start (UT)	Dekametric Band End (UT)	Dekametric Band Int (1-3)	Spectral Type
01	0000	0729	CULG										
	2029	2400	CULG										
02	0000	0730	CULG										
	2030	2400	CULG										
03	0000	0730	CULG										
	2030	2400	CULG										
04	0000	0735	CULG										
	2031	2400	CULG										
05	0000	0730	CULG										
	2030	2400	CULG										
06	0000	0730	CULG										
	2030	2400	CULG										
07	0000	0730	CULG				0437.0		1				IIIB
	2030	2400	CULG										
08	0000	0725	CULG										
	2030	2400	CULG										
09	0000	0730	CULG										
	2030	2400	CULG										
10	0000	0730	CULG										
	2031	2400	CULG										
11	0000	0731	CULG										
	2031	2400	CULG										
12	0000	0731	CULG										
	2032	2400	CULG										
13	0000	0730	CULG										
	2030	2400	CULG										
14	0000	0730	CULG										
	2033	2400	CULG										
15	0000	0732	CULG										
	2032	2400	CULG										
16	0000	0732	CULG										
	2032	2400	CULG										
17	0000	0733	CULG										
	2033	2400	CULG										
18	0000	0732	CULG										
	2032	2400	CULG										
19	0000	0730	CULG										
	2032	2400	CULG										
20	0000	0730	CULG										
	2032	2400	CULG										
21	0000	0730	CULG										
	2032	2400	CULG										
22	0000	0730	CULG										
	2032	2400	CULG										
23	0000	0730	CULG										
	2032	2400	CULG										
24	0000	0730	CULG										
	2145	2400	CULG										

SOLAR RADIO EMISSION SPECTRAL OBSERVATIONS

JUNE 1986

Day	Observation Start (UT)	Observation End (UT)	Sta	Decimetric Band Start (UT)	Decimetric Band End (UT)	Decimetric Band Int (1-3)	Metric Band Start (UT)	Metric Band End (UT)	Metric Band Int (1-3)	Dekametric Band Start (UT)	Dekametric Band End (UT)	Dekametric Band Int (1-3)	Spectral Type
25	0000	0734	CULG										
	2035	2400	CULG										
26	0000	0735	CULG										
	2035	2400	CULG										
27	0000	0735	CULG										
	2035	2400	CULG										
28	0000	0735	CULG										
	2035	2400	CULG										
29	0000	0735	CULG										
	2037	2400	CULG										
30	0000	0735	CULG										
	2035	2400	CULG										

SOLAR RADIO EMISSION SPECTRAL OBSERVATIONS

JULY 1986

Day	Observation Start (UT)	Observation End (UT)	Sta	Decimetric Band Start (UT)	Decimetric Band End (UT)	Decimetric Band Int (1-3)	Metric Band Start (UT)	Metric Band End (UT)	Metric Band Int (1-3)	Dekametric Band Start (UT)	Dekametric Band End (UT)	Dekametric Band Int (1-3)	Spectral Type
01	0000	0735	CULG										
	2036	2400	CULG										
02	0000	0736	CULG										
	2036	2400	CULG										
03	0000	0730	CULG										
	2037	2400	CULG										
04	0000	0730	CULG										
	2037	2400	CULG										
05	0000	0736	CULG										
	2036	2400	CULG										
06	0000	0736	CULG										
	2036	2400	CULG				2142.5		1				III B
			CULG				2146.5		1				III B
07	0000	0736	CULG										
	2036	2400	CULG										
08	0000	0737	CULG				0625.0	0625.5	1				III G,U
			CULG				0641.0	0641.5					III G,U,W
	2036	2400	CULG										
09	0000	0650	CULG										
	2038	2400	CULG	2342.0	2343.0	1	2342.0	2343.0	1				III B,V
10	0000	0737	CULG	0009.0	0012.0	2							DCIM
	2037	2400	CULG										
11	0000	0737	CULG				0451.5	0544.5	1				IS
			CULG				0452.0	0502.5	1				III N
			CULG	0606.5	0607.5	1	0606.5	0607.5	1				III G
	2037	2400	CULG										
12	0000	0737	CULG				0415.0	0609.5	1				IS
	2037	2400	CULG				2109.0	2400.0	1				IS
13	0000	0737	CULG				0000.0	0230.0	1				IS
			CULG	0102.5	0415.0	1							IN
			CULG				0124.0	0124.5	2				III G
			CULG				0230.0	0703.0	1				IN
			CULG				0405.0	0405.5	1				III G
			CULG	0405.0		1	0405.0		1				III B
	2037	2400	CULG				2105.0	2125.0	1				IS
14	0000	0730	CULG				0025.0	0128.0	1				IS,C
	2100	2400	CULG										
15	0000	0737	CULG				0023.5	0024.0	1				III G
			CULG				0317.5		1				III B
	2037	2400	CULG				2349.5		3	2349.5	2350.0	1	III G
			CULG	2351.5		1	2351.5		2				III G
16	0000	0738	CULG	0613.5	0614.0	1	0613.5	0614.0	1	0613.5	0614.0	1	III B,V
	2038	2400	CULG										
17	0000	0738	CULG				0240.0	0254.0	1				IS,C
			CULG				0423.0	0423.5	1				III G
			CULG				0702.5		1				III B
	2038	2400	CULG				2119.0		1				III B,U
18	0000	0738	CULG										
	2038	2400	CULG										
19	0000	0730	CULG				0043.0	0044.0	1				III G
	2042	2400	CULG										
20	0000	0738	CULG										

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

JULY 1986

Day	Observation Start (UT)	Observation End (UT)	Sta	Decimetric Band Start (UT)	Decimetric Band End (UT)	Decimetric Band Int (1-3)	Metric Band Start (UT)	Metric Band End (UT)	Metric Band Int (1-3)	Dekametric Band Start (UT)	Dekametric Band End (UT)	Dekametric Band Int (1-3)	Spectral Type
20	2038	2400	CULG										
21	0000	0738	CULG				0434.5		1				III B
	2038	2400	CULG				2117.0	2118.0	1				III G
22	0000	0738	CULG										
	2038	2400	CULG										
23	0000	0730	CULG										
	2038	2400	CULG										
24	0000	0730	CULG										
	2305	2400	CULG										
25	0000	0648	CULG										
			CULG				0055.0		1				III G
			CULG				0442.0						III B,W
			CULG				0512.5	0513.0	1				III G
			CULG				0545.0		1				III B
	2038	2400	CULG				2134.0	2134.5	2				III G
			CULG				2136.5	2137.5	1				III G
			CULG				2215.0	2216.0	1				III G
			CULG				2223.5	2224.0	1				III B
26	0000	0738	CULG				0604.5		1				III B
	2038	2400	CULG										
27	0000	0738	CULG										
	2038	2400	CULG				2115.0		1				III B,U
28	0000	0738	CULG				0405.5						III B,U,W
	2038	2400	CULG				2101.5	2102.0	1				III G,U
29	0000	0727	CULG										
	2040	2400	CULG										
30	0000	0738	CULG				0322.0		1				III B,U
	2038	2400	CULG				2122.0	2122.5	1				III G
			CULG				2217.5	2219.5					III G,W
31	0000	0738	CULG										
	2038	2400	CULG										

SOLAR RADIO EMISSION SPECTRAL OBSERVATIONS

AUGUST 1986

Day	Observation Start (UT)	Observation End (UT)	Sta	Decimetric Band Start (UT)	Decimetric Band End (UT)	Decimetric Band Int (1-3)	Metric Band Start (UT)	Metric Band End (UT)	Metric Band Int (1-3)	Dekametric Band Start (UT)	Dekametric Band End (UT)	Dekametric Band Int (1-3)	Spectral Type
01	0000	0738	CULG										
	2038	2400	CULG				2121.0		1				III B
02	0000	0738	CULG										
	2038	2400	CULG				2207.5						III G,W
03	0000	0738	CULG										
	2207	2400	CULG										
04	0000	0738	CULG										
	2038	2400	CULG										
05	0000	0738	CULG										
	2038	2400	CULG										
06	0000	0738	CULG										
	2038	2400	CULG										
07	0000	0738	CULG										
	2038	2400	CULG										
08	0000	0738	CULG				0205.5		1				III B
	2038	2400	CULG										
09	0000	0738	CULG										
	2038	2400	CULG										
10	0000	0738	CULG										
	2038	2400	CULG										
11	0000	0738	CULG										
	2038	2400	CULG										
12	0000	0737	CULG										
	2037	2400	CULG										
13	0000	0738	CULG										
	2038	2400	CULG										
14	0000	0737	CULG										
	2037	2400	CULG										
15	0000	0737	CULG										
	2037	2400	CULG										
16	0000	0737	CULG										
	2037	2400	CULG										
17	0000	0736	CULG										
	2036	2400	CULG										
18	0000	0657	CULG										
	2130	2400	CULG										
19	0000	0735	CULG										
	2035	2400	CULG										
20	0000	0735	CULG										
	2035	2400	CULG				2354.5						III B,W
21	0000	0735	CULG										
	2035	2400	CULG										
22	0000	0735	CULG										
	2035	2400	CULG										
23	0000	0735	CULG				0225.5		1				III B
	2035	2400	CULG										
24	0000	0734	CULG										
	2035	2400	CULG										

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

AUGUST 1986

Day	Observation Start (UT)	Observation End (UT)	Sta	Decimetric Band Start (UT)	Decimetric Band End (UT)	Decimetric Band Int (1-3)	Metric Band Start (UT)	Metric Band End (UT)	Metric Band Int (1-3)	Dekametric Band Start (UT)	Dekametric Band End (UT)	Dekametric Band Int (1-3)	Spectral Type
25	0000	0734	CULG										
	2034	2400	CULG										
26	0000	0734	CULG										
	2034	2400	CULG										
27	0000	0733	CULG										
	2033	2400	CULG										
28	0000	0714	CULG										
	2110	2400	CULG										
29	0000	0732	CULG										
	2033	2400	CULG										
30	0000	0732	CULG				0704.5						III B,W
	2032	2400	CULG				2209.5	2210.0	3				III G,U
31	0000	0732	CULG										
	2032	2400	CULG										

SOLAR RADIO EMISSION SPECTRAL OBSERVATIONS

SEPTEMBER 1986

Day	Observation Start (UT)	Observation End (UT)	Sta	Decimetric Band Start (UT)	Decimetric Band End (UT)	Decimetric Band Int (1-3)	Metric Band Start (UT)	Metric Band End (UT)	Metric Band Int (1-3)	Dekametric Band Start (UT)	Dekametric Band End (UT)	Dekametric Band Int (1-3)	Spectral Type
01	0000	0732	CULG										
	2032	2400	CULG										
02	0000	0730	CULG										
	2033	2400	CULG										
03	0000	0730	CULG				0308.0	0308.5	3				III G
			CULG				0626.0	0627.0	2				III G
			CULG				0648.0	0649.0					III G,W
	2033	2400	CULG										
04	0000	0731	CULG										
	2031	2400	CULG										
05	0000	0730	CULG										
	2030	2400	CULG										
06	0000	0730	CULG										
	2030	2400	CULG										
07	0000	0730	CULG										
	2030	2400	CULG										
08	0000	0730	CULG				0103.0		1				III B
			CULG	0322.5		2	0322.5		2				III B
			CULG				0324.5						III B,W
			CULG	0447.0	0447.5	1							III G
			CULG				0515.5	0517.5	2	0516.0	0517.0	2	III G,V
			CULG				0607.5		1				III B
			CULG				0621.0	0627.0	2				III G,V
	2030	2400	CULG										
09	0000	0730	CULG										
	2030	2400	CULG										
10	0000	0730	CULG										
	2030	2400	CULG										
11	0000	0659	CULG										
	2028	2400	CULG										
12	0000	0655	CULG										
	2028	2400	CULG										
13	0000	0704	CULG										
	2028	2400	CULG										
14	0000	0650	CULG										
	2028	2400	CULG										
15	0000	0728	CULG										
	2028	2400	CULG										
16	0000	0728	CULG										
	2028	2400	CULG										
17	0000	0726	CULG										
	2028	2400	CULG										
18	0000	0726	CULG										
	2027	2400	CULG										
19	0000	0726	CULG										
	2028	2400	CULG										
20	0000	0725	CULG										
	2025	2400	CULG										
21	0000	0725	CULG										
	2025	2400	CULG										
22	0000	0725	CULG										

SOLAR RADIO EMISSION SPECTRAL OBSERVATIONS

SEPTEMBER 1986

Observation				Decimetric Band			Metric Band			Dekametric Band			
Day	Start (UT)	End (UT)	Sta	Start (UT)	End (UT)	Int (1-3)	Start (UT)	End (UT)	Int (1-3)	Start (UT)	End (UT)	Int (1-3)	Spectral Type
24	2024	2400	CULG										
25	0000	0723	CULG										
	2119	2400	CULG										
26	0000	0724	CULG										
	2025	2400	CULG										
27	0000	0723	CULG										
	2032	2400	CULG										
28	0000	0722	CULG										
	2023	2400	CULG										
29	0000	0722	CULG										
	2022	2400	CULG										
30	0000	0722	CULG										
	2022	2400	CULG										

SOLAR RADIO EMISSION SPECTRAL OBSERVATIONS

OCTOBER 1986

Day	Observation Start (UT)	Observation End (UT)	Sta	Decimetric Band Start (UT)	Decimetric Band End (UT)	Decimetric Band Int (1-3)	Metric Band Start (UT)	Metric Band End (UT)	Metric Band Int (1-3)	Dekametric Band Start (UT)	Dekametric Band End (UT)	Dekametric Band Int (1-3)	Spectral Type
01	0000	0730	CULG										
	2023	2400	CULG										
02	0000	0722	CULG										
	2022	2400	CULG										
03	0000	0721	CULG										
	2021	2400	CULG										
04	0000	0721	CULG										
	2243	2400	CULG										
05	0000	0720	CULG				0202.0	0203.5	1	0203.5		1	III GG
	2020	2400	CULG										
06	0000	0603	CULG										
	2020	2400	CULG				2336.5	2337.0	1				III G
07	0000	0719	CULG				0424.0	0425.0					III G,W
	2020	2400	CULG										
08	0000	0720	CULG										
	2020	2400	CULG	2213.5	2214.0	1	2213.5	2214.5	3	2213.5	2214.5	2	III G
			CULG				2218.0						III B,W
			CULG	2220.0	2221.0	1	2220.0	2221.0	3	2220.0	2221.0	2	III G
09	0000	0720	CULG				0546.5	0547.0	2				III G
			CULG				0615.0	0616.0					III B,W
	2019	2400	CULG										
10			CULG										
	0000	0719	CULG				0229.0	0229.5	1				III G
	2019	2400	CULG										
11	2020	2400	CULG										
12	0000	0718	CULG										
	2018	2400	CULG										
13	0000	0718	CULG				0635.5						III B,W
	2018	2400	CULG				2221.0						III B,W
			CULG				2311.0	2315.5					III G,W
14	0000	0718	CULG				0308.0	0308.5					III B,W
			CULG				0320.0	0321.0		0321.0			III G,W
	2018	2400	CULG				2201.0		1	2201.0		1	III B
15	0000	0718	CULG				0625.5	0626.0					III G,W
			CULG				0700.0	0701.0	1				III G
	2018	2400	CULG				2058.0	2058.5	2				III G,U
			CULG				2133.5	2134.0					III B,U,W
			CULG				2236.5	2238.0	2	2237.0	2237.5	1	III G,V
			CULG				2250.5	2256.0	1				III G
16	0000	0624	CULG				0059.0	0059.5	1	0059.0		1	III G
			CULG				0102.0		1				III B
			CULG				0245.5	0246.0	2	0245.5	0246.0	2	III G
			CULG				0356.0	0408.0	2	0356.0	0406.5	2	III G
			CULG				0409.5	0426.0	3				II
			CULG				0520.0						III G,W
			CULG				0549.0						III G,W
	2017	2400	CULG				2017.0	2323.0	1				IS
			CULG				2019.5	2359.5	1				III N
			CULG				2035.5	2036.0	3	2035.5	2036.0	3	III G
			CULG				2047.0	2047.5	2				III G,U
			CULG				2201.0	2202.0	3				III G,U
			CULG	2202.5	2204.0	2	2202.5	2205.0	3	2203.0	2205.0	3	III G,V
			CULG	2205.0	2339.0	1	2157.0	2339.0	2	2220.0	2339.0	2	III G,N
17	0000	7170	CULG	0001.0	0008.5	1	0000.0	0717.0	1				IN
			CULG				0004.0	0004.5	3	0004.0	0004.5	2	III G

SOLAR RADIO EMISSION SPECTRAL OBSERVATIONS

OCTOBER 1986

Day	Observation Start (UT)	Observation End (UT)	Sta	Decimetric Band Start (UT)	Decimetric Band End (UT)	Decimetric Band Int (1-3)	Metric Band Start (UT)	Metric Band End (UT)	Metric Band Int (1-3)	Dekametric Band Start (UT)	Dekametric Band End (UT)	Dekametric Band Int (1-3)	Spectral Type
17			CULG				0004.5	0715.0	1	0140.0	0155.5	1	IIIN,U
			CULG	0050.5	0053.0	1	0047.5	0053.0	3	0048.0	0053.0	2	IIIGG,U
			CULG				0520.0	0520.5	3				IIIG,U
			CULG				0532.0	0533.0	3	0532.5		1	IIIG,U
			CULG				0616.5	0649.0	1				IS
			CULG	0646.5	0647.5	1	0646.5	0648.0	3				IIIG,U,V
	2017	2400	CULG				2017.0	2400.0	1				IS,C
			CULG				2021.5	2400.0	1				IIIS
			CULG	2042.0	2047.0	2	2041.5	2047.0	3	2043.0	2046.0	3	IIIGG,V
			CULG	2143.0	2342.0	1	2143.0	2342.0	2				IIIN
			CULG				2145.5	2146.5	3	2145.5	2146.5	3	IIIG,V
			CULG				2313.0	2314.0	3	2313.0	2314.0	3	IIIG,V
			CULG	2325.5	2328.5	1	2325.5	2328.5	3	2326.5	2328.5	3	IIIGG
			CULG	2354.5	2355.0	2	2354.5	2355.5	3	2354.5	2355.5	3	IIIG,V
18			CULG				0000.0	0717.0	1				IS
	0000	0717	CULG				0000.0	0622.5	1				IIIN
			CULG	0012.0	0013.5	2	0010.0	0023.0	3	0005.0	0013.5	3	IIIGG
			CULG	0015.5	0350.5	2	0031.0	0658.0	2	0016.0	0657.0	2	IIIG,N
			CULG	0029.0	0030.0	2	0029.5	0030.0	1				IIIG
			CULG	0341.5	0342.0	1	0341.5	0343.5	3	0341.5	0344.0	3	IIIGG,V
	2017	2400	CULG				2017.0	2400.0	1				IS
			CULG				2019.5	2328.5	1				IIIN
			CULG				2024.5	2136.0	3				IIIG,N
			CULG				2041.0	2136.5	2				IIIG,N
			CULG	2223.0	2223.5	1	2222.0	2225.0	3	2222.5	2224.0	2	II GG,V
			CULG	2252.0		1	2252.0	2253.0	3	2252.0	2252.5	2	IIIG,V
19	0000	0716	CULG	0000.0	0716.5	1	0000.0	0716.5	1				IS
			CULG				0005.0	0705.5	2	0228.0	0541.0	1	IIIN
			CULG				0007.5	0011.5	1	0007.5	0011.5	1	IIIG
			CULG							0029.0	0051.0	1	SWF
			CULG				0033.0	0101.0	3	0039.0	0103.0	2	II ,H
			CULG	0033.0	0110.0	1	0040.0	0220.0	1				IV
			CULG				0151.5	0157.5	3	0151.5	0157.5	3	IIIGG
	2016	2400	CULG				2016.5	2400.0	1				IS
			CULG	2020.5	2324.5	2	2020.0	2308.0	2	2025.0	2308.0	2	IIIG,N
			CULG	2031.0	2035.0	2	2031.0	2035.0	3				IIIG,V
			CULG	2225.0	2227.0	3	2225.0	2228.0	3				IIIG,V
			CULG				2320.0	2325.0	3				IIIG,V
20	0000	0700	CULG				0000.0	0700.0	1				IS
			CULG				0014.0	0643.0	2	0014.0	0606.0	1	IIIG,N
			CULG	0322.5	0325.5	1	0322.0	0327.5	3	0322.0	0328.5	3	IIIGG,V
	2020	2200	CULG				2018.0	2200.0	1				IS
			CULG				2038.0	2042.0	2				IIIG
			CULG				2102.0	2107.5	1				IIIN
			CULG				2118.0	2120.0	2				IIIG
21	0408	0718	CULG										
23	2018	2400	CULG										
			CULG				2137.0	2400.0	1				IS
24	0000	0711	CULG				0000.0	0150.0	1				IN
	2016	2400	CULG				2121.5	2400.0	1				IN
			CULG				2152.0	2153.0	2				IIIG
			CULG				2348.5	2349.0	2				IIIB,U
25			CULG				0000.0	0711.0					IIINW
	0000	0711	CULG				0000.0	0711.0	1				IS
			CULG				0039.5	0041.5	2	0040.5		1	IIIG
			CULG				0300.0	0301.5	3	0300.5	0301.0	1	IIIG
	2016	2400	CULG				2016.0	2400.0					IS,W
			CULG				2051.5	2400.0					IIIN,W
26			CULG				0000.0	0715.0					IIIN,W
	0000	0716	CULG				0000.0	0715.0					IS,W
	2016	2400	CULG				2016.0	2400.0	1				IS
			CULG				2338.5	2339.0	2				IIIB
27	0000	0716	CULG				0000.0	0126.0	1				IS

SOLAR RADIO EMISSION SPECTRAL OBSERVATIONS

OCTOBER 1986

Day	Observation Start (UT)	Observation End (UT)	Sta	Decimetric Band Start (UT)	Decimetric Band End (UT)	Decimetric Band Int (1-3)	Metric Band Start (UT)	Metric Band End (UT)	Metric Band Int (1-3)	Dekametric Band Start (UT)	Dekametric Band End (UT)	Dekametric Band Int (1-3)	Spectral Type
27			CULG				0139.0		1				IIIB
	2016	2400	CULG				2033.0		1				IIIB
			CULG				2123.0	2123.5	2				IIIB,U
28	0000	0718	CULG										
			CULG				0548.0		1				IIIB
	2017	2400	CULG										
29	0000	0715	CULG				0332.5	0333.0	1				IIIB,U
			CULG	0357.5	0518.5	1							IN
			CULG				0517.5	0518.0	2				IIIG
			CULG				0525.0	0526.0	2				IIIG
			CULG				0714.5		1				IIIB,U
	2015	2400	CULG	2046.5	2048.0	1							IIIN
			CULG				2105.0		1				IIIB,U
			CULG				2156.5	2157.0	1				IIIG
			CULG				2159.5	2200.0	1				IIIG
30			CULG				0003.0	0125.0	1				IS
	0000	0715	CULG				0003.0		2				IIIB
			CULG				0014.5	0016.5	1				IIIG
			CULG	0016.5	0017.5	1	0016.5	0017.5	2				IIIG,U
			CULG				0031.5	0033.0	2				IIIG,V
			CULG				0412.0		1				IIIG
	2015	2400	CULG	2214.0		1	2213.5	2214.5	2				IIIG,U
			CULG				2332.5		1				IIIB
31	0000	0715	CULG	0104.0	0115.0	1	0054.0	0657.5	1				IN
			CULG				0705.0		2				IIIB
	2015	2400	CULG				2016.0		1				IIIB
			CULG				2116.0	2400.0	1				IS
			CULG				2116.5	2400.0	1				IIIS
			CULG				2119.0	2121.0	2				IIIG,V

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

NOVEMBER 1986

Day	Observation Start (UT)	Observation End (UT)	Sta	Decimetric Band Start (UT)	Decimetric Band End (UT)	Decimetric Band Int (1-3)	Metric Band Start (UT)	Metric Band End (UT)	Metric Band Int (1-3)	Dekametric Band Start (UT)	Dekametric Band End (UT)	Dekametric Band Int (1-3)	Spectral Type
01	0000	0715	CULG				0000.0	0650.0	1				IS
			CULG				0003.0	0715.0					IIIS,W
	2015	2400	CULG				2015.5	2400.0	2				IS
			CULG				2020.0	2344.0	1				IIIN
02	0000	0715	CULG				0000.0	0715.0	1				IS
			CULG				0002.0	0710.0	1				IIIS
			CULG				0004.0		2				IIIB
			CULG				0123.0	0126.5	2	0123.0	0126.5	2	IIIG
			CULG				0217.0	0218.0	2				IIIG
			CULG				0227.0	0227.5	3	0227.0	0227.5	3	IIIB,V
	2017	2040	CULG				2259.0	2332.5	1	2259.0	2332.5	1	IIIN
03	0000	0715	CULG				0049.0		1				IIIB
			CULG				0423.5	0425.0	2	0423.5	0425.0	2	IIIG
	0444		CULG				0444.0		1	0443.5	0444.0	1	IIIG
			CULG				0619.5		1				IIIB
	2015	2400	CULG										
04	0000	0715	CULG	0702.0	0704.0	2	0701.5	0704.0	2				IIIGG
	2015	2400	CULG										
05	0000	0715	CULG										
	2015	2400	CULG	2244.5	2245.0	1	2244.5	2246.0	2	2245.0		1	IIIG
			CULG	2348.0	2349.0	1	2348.0	2350.0	2				IIIG
06	0000	0715	CULG	0221.5	0222.0	1	0221.0	0222.5	2				IIIG
			CULG				0712.0	0712.5	1				IIIG
	2015	2400	CULG	2201.5	2203.0	1	2159.5	2204.0	2	2202.0	2202.5	1	IIIGG,V
07	0000	0348	CULG										

The symbols used under the column heading SPECTRAL TYPE have the following definitions:

B = Single burst
G = Small group (< 10) of bursts
GG = Large group (> 10) of burst
C = Underlying continuum (particularly with Type I)
S = Storm in the sense of intermittent but apparently connected activity
N = Intermittent activity in this period
U = U-shaped burst of Type III

RS = Reverse slope burst
DP = Drifting pairs
DC = Drifting Chains
H = Herringbone
W = Weak
P = Pulsations
CONT = Continuum
UNCLF = Unclassified activity
DCIM = Fast drift

MAGNETIC STORM SUDDEN COMMENCEMENTS AND SOLAR FLARE EFFECTS
(PRELIMINARY REPORT ON RAPID MAGNETIC VARIATIONS)

MARCH 1987

Storm Sudden Commencements (ssc)			Solar Flare Effects (sfe)		
Day	Time	Quality: Station Group*	Day	Begin-End	Station(s)
		n o n e	02	1102-1110	MPO
			04	1323-1458	TEN
			09	1024-1030	NCK
			11	0727-0734	CLF MPO
			14	1404-1413	NCK
			18	0709-0805	SOD
			24	0836-0853	TEN MPO
			25	1544-1549	CLF
			26	1043-1119	NGK NCK EBR
			28	1024-1033	MPO
			30	1109-1118	MPO

Reporting Observatories:

SOD COL DOB NUR WNG WIT NGK DOU BDV CLF NCK GCK MMB AQU
EBR COI SPT KAK HTY KNY QEU TEN MPO GNA AMS CZT KGL DUM

*Three-letter codes identify each observatory. Reporting stations have been grouped by the character of the observed event. The letter A means very remarkable; B means fair, ordinary, but unmistakable; and C means very poor, doubtful.

APRIL 1987

Storm Sudden Commencements (ssc)			Solar Flare Effects (sfe)		
Day	Time	Quality: Station Group*	Day	Begin-End	Station(s)
04	0416	A: SOD DOB NUR WNG WIT VAL DOU CLF NCK COI SPT LNP MPO AMS CZT KGL DUM	02	1104-1116	QUE
			11	0054-0100	QUE
			15	0733-0750	MMB KNY
		B: NGK BDV GCK MMB AQU EBR KAK KNY	26	0043-0046	QUE

Reporting Observatories:

SOD DOB NUR WNG WIT NGK VAL DOU BDV CLF NCK GCK MMB AQU
EBR COI SPT KAK KNY QUE TEN LNP MPO AMS CZT KGL DUM

*Three-letter codes identify each observatory. Reporting stations have been grouped by the character of the observed event. The letter A means very remarkable; B means fair, ordinary, but unmistakable; and C means very poor, doubtful.

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Late
Feb 87

WDC-C2 FOR GEOMAGNETISM, KYOTO UNIVERSITY

HOURLY EQUATORIAL DST VALUES(PROVISIONAL)

FEBRUARY 1987

UNIT=NT U.T.

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	-19	-16	-15	-16	-21	-18	-15	-13	-13	-13	-15	-15	-14	-12	-10	-6	-3	-11	-16	-19	-19	-19	-24	-23
2	-20	-19	-18	-17	-18	-18	-18	-17	-19	-17	-16	-17	-15	-13	-12	-11	-8	-11	-11	-14	-16	-15	-15	-13
3	-12	-8	-7	-8	-8	-8	-10	-14	-14	-13	-14	-14	-13	-12	-12	-11	-12	-13	-15	-15	-14	-14	-13	-13
4	-14	-13	-15	-14	-12	-11	-11	-11	-12	-11	-8	-7	-7	-10	-11	-13	-19	-21	-18	-12	-10	-8	-6	-8
5	-10	-13	-13	-11	-10	-6	-1	0	0	-3	-4	-2	-4	-6	-6	-7	-5	1	3	3	3	0	-2	-8
6	-10	-12	-14	-14	-14	-13	-11	-6	-6	-4	1	-2	-4	-1	-1	0	3	3	1	0	-5	-9	-17	-22
7	-20	-19	-21	-20	-19	-18	-19	-17	-19	-16	-8	-4	-6	-8	-7	-8	-10	-9	-6	-6	-8	-13	-13	-13
8	-10	-8	-17	-18	-17	-25	-32	-31	-25	-23	-14	-12	-16	-19	-21	-25	-27	-31	-32	-32	-30	-28	-24	-24
9	-30	-29	-26	-26	-31	-31	-30	-30	-32	-27	-24	-20	-21	-23	-22	-19	-17	-16	-18	-19	-22	-27	-27	-26
10	-19	-18	-19	-19	-26	-26	-25	-23	-24	-25	-25	-22	-22	-22	-17	-15	-17	-18	-17	-17	-17	-12	-12	-11
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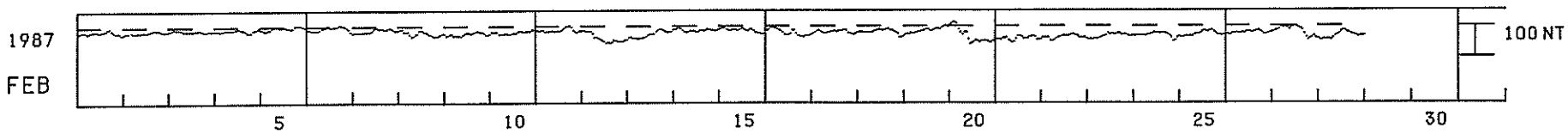
28	-46	-45	-43	-44	-42	-42	-46	-39	-32	-29	-25	-19	-15	-15	-20	-22	-26	-27	-30	-33	-35	-32	-32	-31



WDC-C2 FOR GEOMAGNETISM, KYOTO UNIVERSITY

HOURLY EQUATORIAL DST VALUES(PROVISIONAL)

MARCH 1987

UNIT=NT U.T.

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	-18	-13	-17	-24	-26	-28	-25	-22	-20	-16	-15	-16	-16	-17	-18	-18	-20	-19	-25	-28	-32	-29	-28	-30
2	-29	-27	-25	-24	-23	-23	-22	-21	-21	-19	-20	-21	-22	-22	-22	-20	-18	-19	-20	-19	-18	-17	-15	-15
3	-17	-18	-19	-18	-14	-14	-13	-14	-15	-14	-10	-10	-9	-10	-13	-13	-15	-19	-18	-16	-10	-10	-14	-17
4	-22	-18	-13	-14	-18	-21	-21	-21	-22	-22	-24	-18	-17	-15	-16	-14	-14	-18	-22	-22	-20	-20	-18	-16
5	-14	-13	-11	-18	-27	-27	-19	-14	-20	-18	-15	-19	-23	-33	-35	-30	-34	-37	-37	-33	-28	-29	-34	-33
6	-32	-32	-30	-29	-29	-30	-30	-28	-27	-22	-24	-24	-22	-20	-19	-17	-20	-21	-22	-22	-21	-30	-31	-33
7	-39	-37	-31	-27	-30	-33	-39	-46	-52	-52	-45	-40	-39	-42	-42	-38	-35	-34	-33	-34	-35	-37	-33	-30
8	-32	-35	-34	-32	-32	-33	-24	-15	-18	-26	-31	-31	-30	-32	-33	-34	-34	-30	-25	-28	-29	-33	-32	-30
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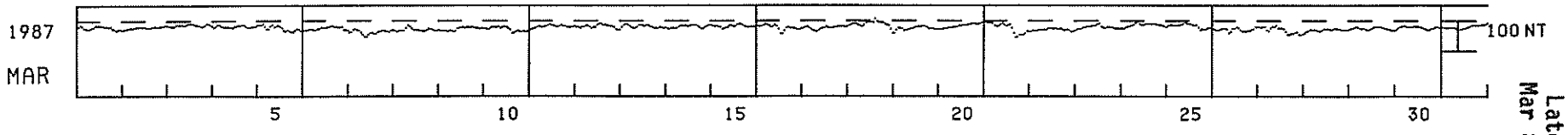

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Late
Mar 87

WORLD DATA CENTER A
FOR
SOLAR-TERRESTRIAL PHYSICS

The ICSU Panel on WDCs has recommended that it would be appropriate courtesy to acknowledge in publications that data were obtained from the originating station or investigator through the intermediary of the WDCs. The following statement is suggested:

"Data used in this study were provided by WDC-A for Solar-Terrestrial Physics, NOAA E/GC2, 325 Broadway, Boulder Colorado 80303, USA."